1942 BUICK SONOMATIC RADIOS

INSTALLATION INSTRUCTIONS

Radio packages contain all necessary parts for installing radios in 1942 Buick cars. Antenna parts are not included. For Series 40-60-90 use Radio Package Part No. 980690. For Series 50-70 use Radio Package Part No. 980691. Antenna packages are as follows:

All closed body models.....Part No. 980688
All 44C Convertibles .....Part No. 980689
All 56C & 76C Convertibles....Part No. 980695

Radio parts list will be found on pages 12-90 to 12-92 inclusive.

The use of antennæ other than those referred to above are not recommended. The receivers are not designed to match these particular antennæ, and the performance of the receiver will be greatly decreased if used with an antenna that does not match.

Check contents of complete package according to package list on page 12-80. Make certain all tubes and vibrator are pushed down into their sockets. These are made accessible by removing the rear case cover which is secured by three screws located in the bottom edge of the rear cover. See that there is no paint on the large hex spacer nuts located on the control shafts. These are the points of contact with the instrument panel and must be clean to provide a good ground for the receiver.

INSTALLING ANTENNAE

NOTE: The following instructions include information necessary to install antennæ on all 1942 models.

Antenna Part No. 980688—Used on all Closed Body Models

A small dimple will be found in the center of the top directly above the windshield in the approximate location shown. (See Fig. 12-103.) If unable to locate, remove small spot of paint with duco thinner. Using this dimple for the $1\frac{1}{8}$" hole, first drill a $\frac{1}{8}$" hole and then use circular cutter tool KMO-254, holding the tool at right angles to the windshield. If this tool is not available, a slightly larger hole will be necessary because of the angle, scribe a $1\frac{3}{16}$" circle, drill and file out. Scotch tape spread over the surface after the center is located will protect the finish from being accidentally scratched.

Antenna "Lead-In" Wire

The proper location of the "lead-in" wire is shown in Fig. 12-104. It is necessary to remove the center strip from the inside of the windshield and also the escutcheon from the top center of the windshield garnish molding. This requires the removal of the rear vision mirror and the center strip screw.

Two "slits" (at right angles to each other) should be cut through the headlining directly in the center and opposite the hole just drilled in the top. By holding the headlining tightly against the header reinforcement (Fig. 12-103) a hole $1\frac{1}{4}$" in diameter can be felt in the reinforcement. The slits should extend only across this hole.

The "lead-in" is then fed up through the hole in the center of the instrument panel (see Fig. 12-104E) until the bare metal shielding (on the "lead-in") protrudes through the panel approximately $\frac{1}{2}$". Clip No. 1321039 should then be installed (Fig. 12-104E) to prevent the wire from shifting and to establish positive ground.

NOTE: The correct installation of the bare metal shielding and this clip is important in preventing ignition interference in the radio.

The upper end of the "lead-in" should then be passed through the rear vision mirror bracket (Fig. 12-104A) up through the center of windshield garnish molding and fished out of slit hole in the headlining. The hole above the windshield molding is approximately $\frac{1}{2}$" to the right of the center. (This is to avoid the possibility of the molding escutcheon screw damaging the "lead-in" during installation.) All of the slack wire should be pulled up into the top. Do not pull hard on wire as this may break the small lead inside loom.

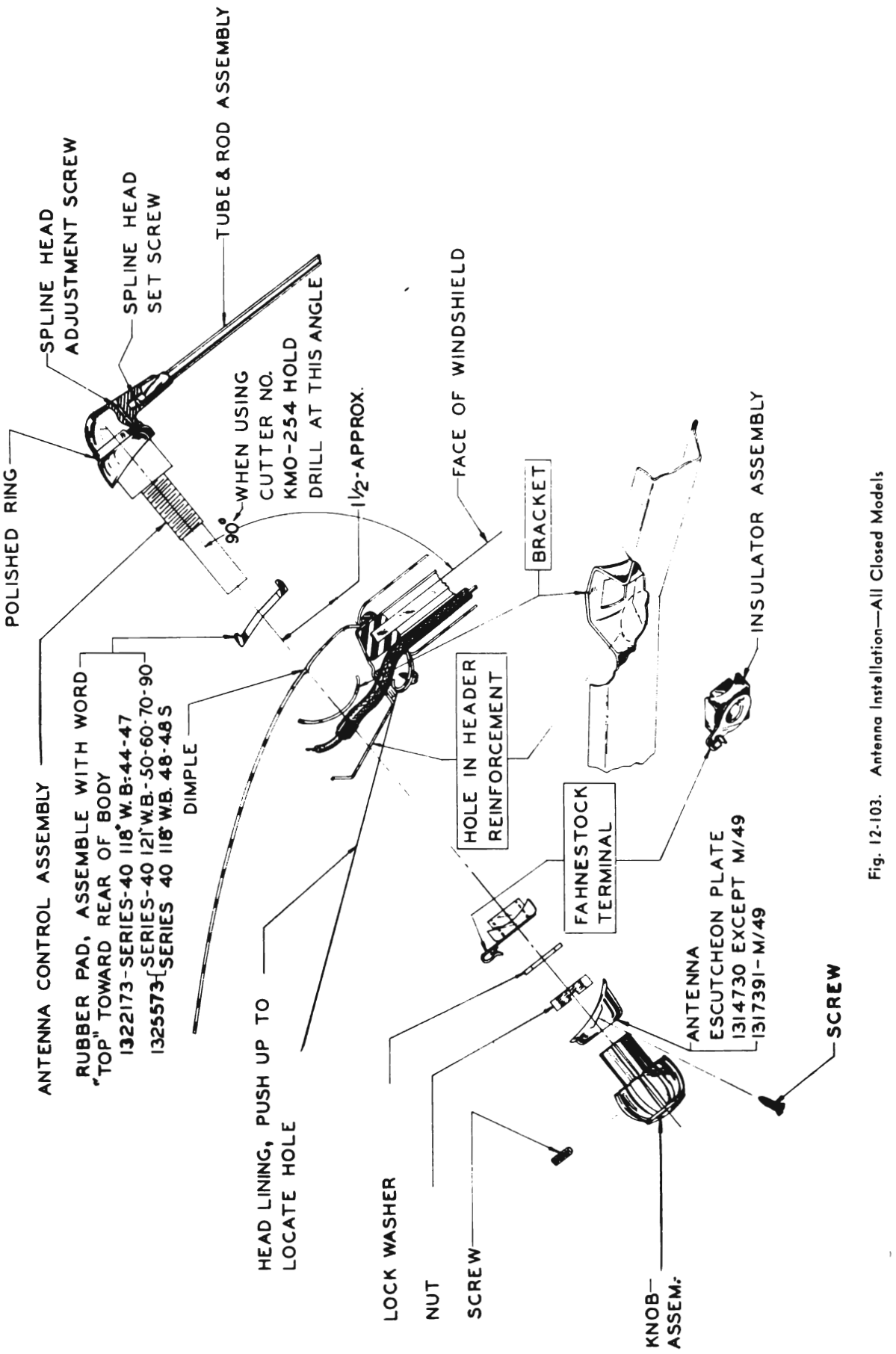


Fig. 12-103. Antenna Installation—All Closed Models

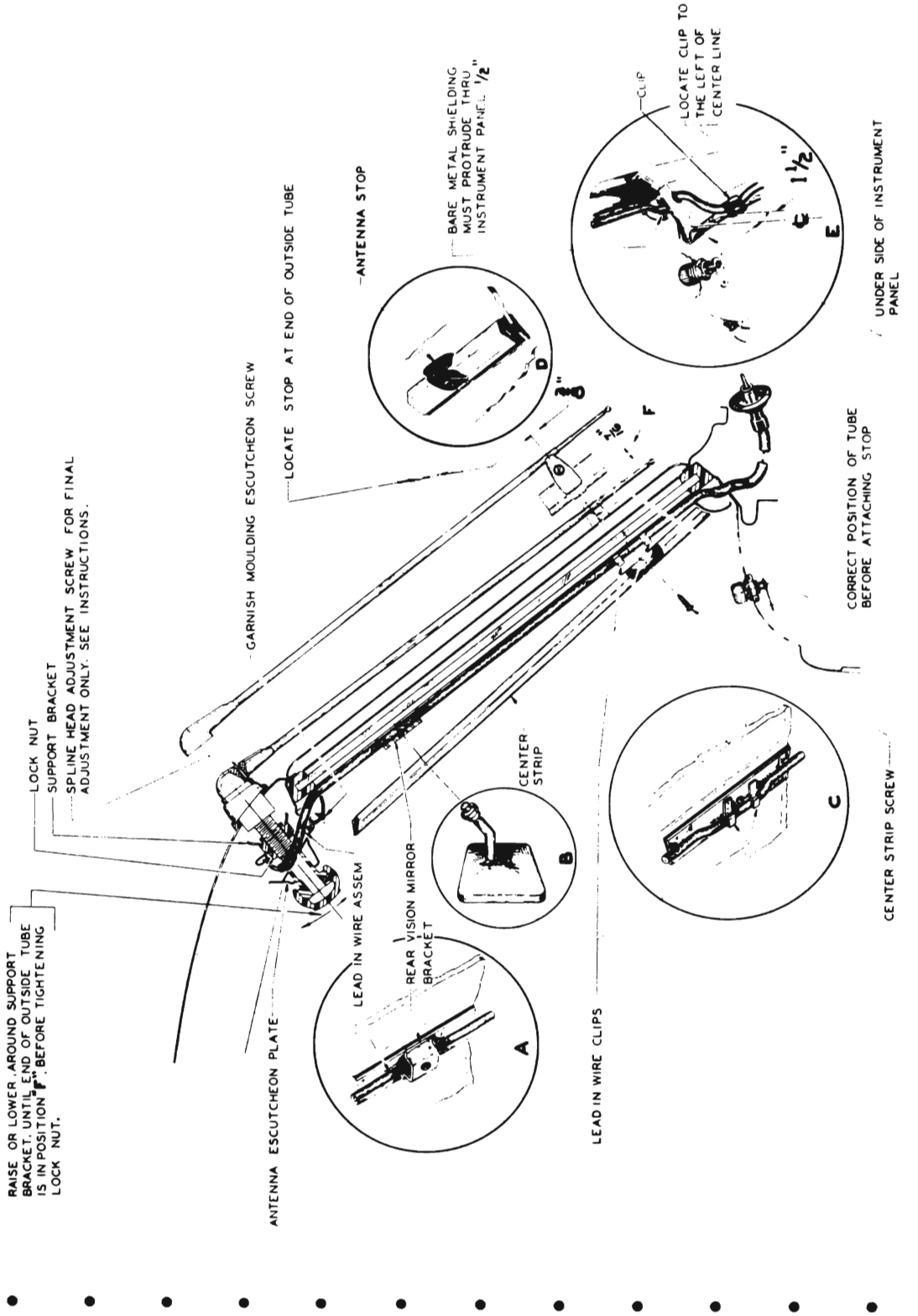


Fig. 12-104. Antenna "Lead-In" Wire Installation—All Closed Models

Assembling Rod and Tube to Antenna Control

A special spline type wrench is provided in each package to tighten the set screw after the rod and tube have been installed. The spline head set screw must be entirely removed before the rod and tube assembly can be inserted. A small hole will be found in the end of the tube. This should be lined up with the screw hole, the screw installed and tightened securely.

Two rubber pads are provided to take care of all 1942 series Buick closed cars. The numbers of the series for which each pad is intended, as well as the word "Top," are embossed on the underside of the pads. Only one pad is used with each antenna.

Installing Antenna Control Assembly

Two men and tools No. J-1339 and J-1340 (tools available through Hinckley-Meyers, Jackson, Michigan) will be required for this operation and it must be done in the following sequence:

1. Insert bare end of "lead-in" wire into the Fahnestock terminal on the hard rubber insulator. (Fig. 12-103.)

2. Push the slack wire up into the hole and insert insulator up through the hole in the header reinforcement. Locate in the square hole of the bracket just back of the header reinforcement. (Fig. 12-103.) The Fahnestock terminal must be located in the upper left corner.

3. While one man holds this insulator in place, the other should insert the antenna control assembly through the hole in the top and through the hole in the insulator.

4. Install lockwasher and run nut up until the assembly is snug but not tight. See that point of adjustment screw does not strike polished ring. (Fig. 12-103.)

5. Place tube in the "down" position and raise or lower the inside of the antenna control assembly until the end of the outside tube is $\frac{7}{16}$" from the top of the outside windshield center strip. (Fig. 12-104F.)

NOTE: It is essential that this adjustment be made correctly in order that the rod and tube assembly can be easily located in the "stop" by means of the control knob inside the car.

6. Using special Spanner Wrench No. J-1339 the man on the outside must hold the antenna body so that the tube lines up with the center strip when lowered. Tighten the nut on the inside securely with special Wrench No. J-1340. Fig. 12-105.

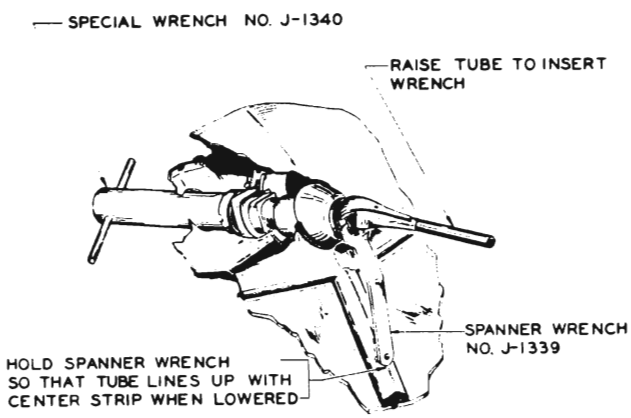


Fig. 12-105. Installing Antenna Control Assembly

7. Install antenna escutcheon plate. (Fig. 12-103. (Screw holes are provided in the header reinforcement.)

8. Install knob and tighten set screw securely. The windshield center strip, rear vision mirror, bottom screw in center strip, and the escutcheon plate in the top center of the windshield molding can now be reinstalled.

NOTE: If there is any doubt of the location of the Fahnestock terminal the "lead-in" should be checked for "grounds" with an ohm meter. It should, of course, show an entirely "open" circuit. *Do not* check with a lamp or any device drawing current, as the conductor inside of the loom is only .010" in diameter and will burn off easily if grounded. For the same reason, care should be taken to see that the bare

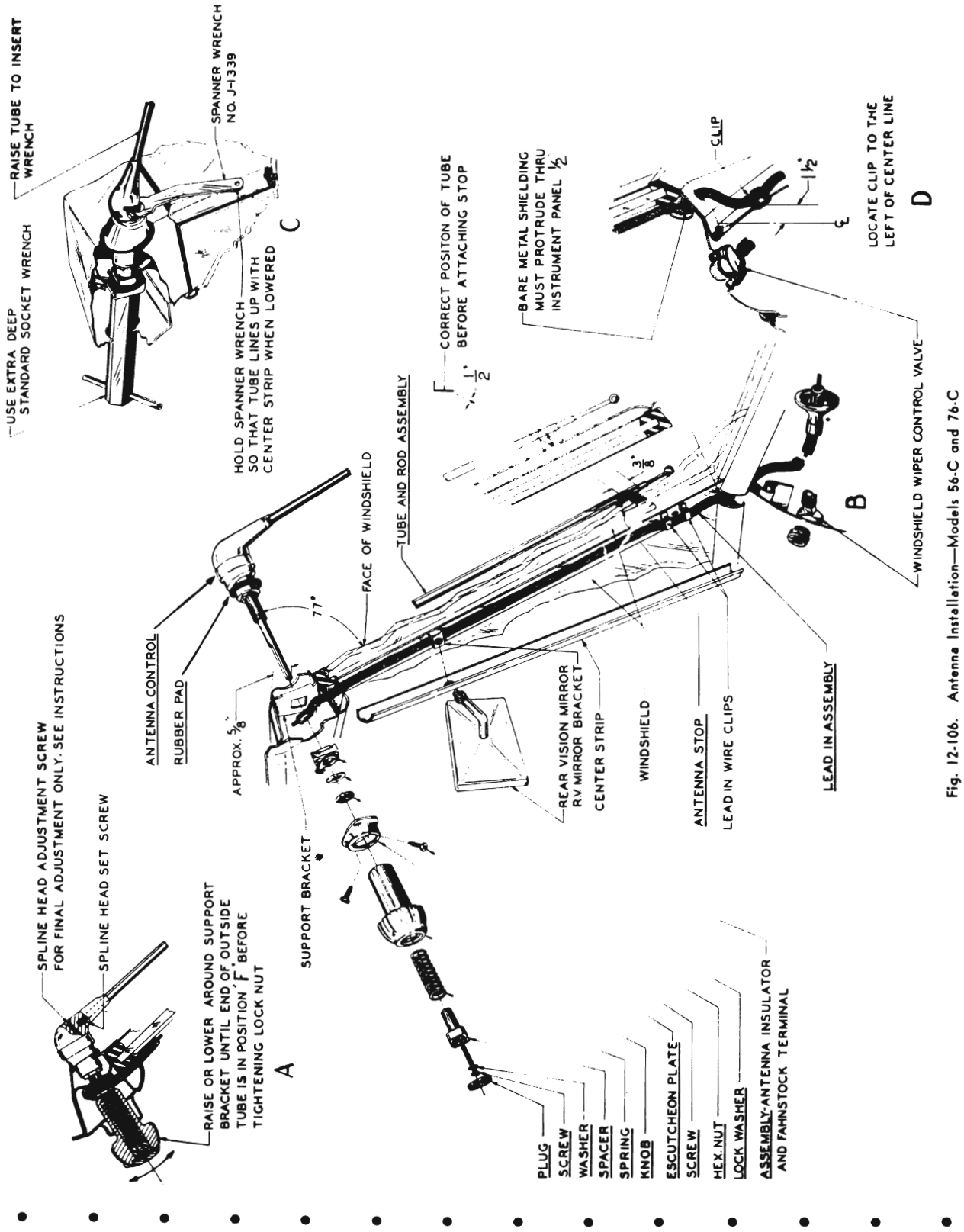
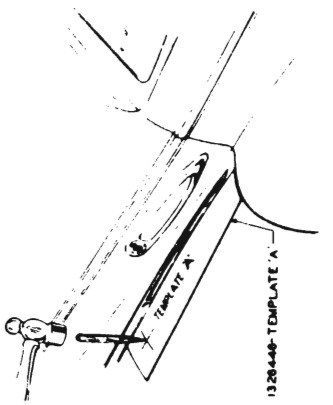


Fig. 12-106. Antenna Installation—Models 56-C and 76-C

1. PLACE TEMPLATE 'A' ON LEFT FRONT FENDER LOCATE CENTER OF HOLE WITH CENTER PUNCH AND DRILL 1⅛ HOLE AS SHOWN IN FIG 6 USING TOOL J-1272-B
2. REMOVE TRIM PANEL AND INSULLATION BATTS FROM LEFT SIDE OF SHROUD. REMOVE PLUGS FROM THE TWO 1⅛ HOLES AND INSERT GROMMETS (FIG 2)
3. ASSEMBLE ALL THREE HOSES TO THE ANTENNA VALVE INSTALL ON LOWER FLANGE OF INSTRUMENT PANEL. (FIG 3)
4. LOCATE (FIG 1-A) DRILL AND ELONGATE HOLE IN GRAVEL DEFLECTOR. INSTALL ANTENNA ASSEMBLY IN FENDER. ATTACHING TO FENDER AND DEFLECTOR AS SHOWN IN SKETCH. ELONGATED HOLES PERMIT MOVEMENT SO ANTENNA MAY BE SET IN A VERTICAL POSITION. TIGHTEN NUTS SECURELY. (SEE NOTE-FIG 1)
5. DISCONNECT SUCTION HOSE FROM WINDSHIELD WIPER CONTROL VALVE. INSTALL TEE CONNECTOR AND SHORT SECTION (2") OF HOSE. (FIG 4) CONNECT ALL SUCTION HOSE AS SHOWN IN SKETCH, START CAR MOTOR AND TEST OPERATION OF ANTENNA. PUSH VALVE KNOB UP TO RAISE ANTENNA. PULL KNOB DOWN TO LOWER.
6. CLIP LEAD-IN CABLE TO DASH (FIG 5) AND RUN THROUGH HOLE IN LARGE GROMMET IN UPPER CORNER OF DASH, THEN OVER TO RADIO AND PLUG IN. ASSEMBLE TO ANTENNA. (FIG 1)
7. WHEN LOCATION OR CONDITIONS WARRANT EXTRA HEIGHT, THE ANTENNA CAN BE FURTHER EXTENDED TWO SECTIONS B' PULLING UPWARD ON THE BALL. THESE SECTIONS MUST ALSO BE LOWERED MANUALLY. FOR BEST OPERATION OF ANTENNA OCCASIONALLY WIPE CLEAN.
8. IMPORTANT AFTER THE INSTALLATION OF ANTENNA AND RECEIVER HAS BEEN COMPLETED, THE ANTENNA COIL IN THE RECEIVER SHOULD BE MATCHED TO THE CAR ANTENNA

NOTE TOOL J-1272-B IS AVAILABLE THROUGH HINKLEY MEYERS CO., JACKSON MICHIGAN



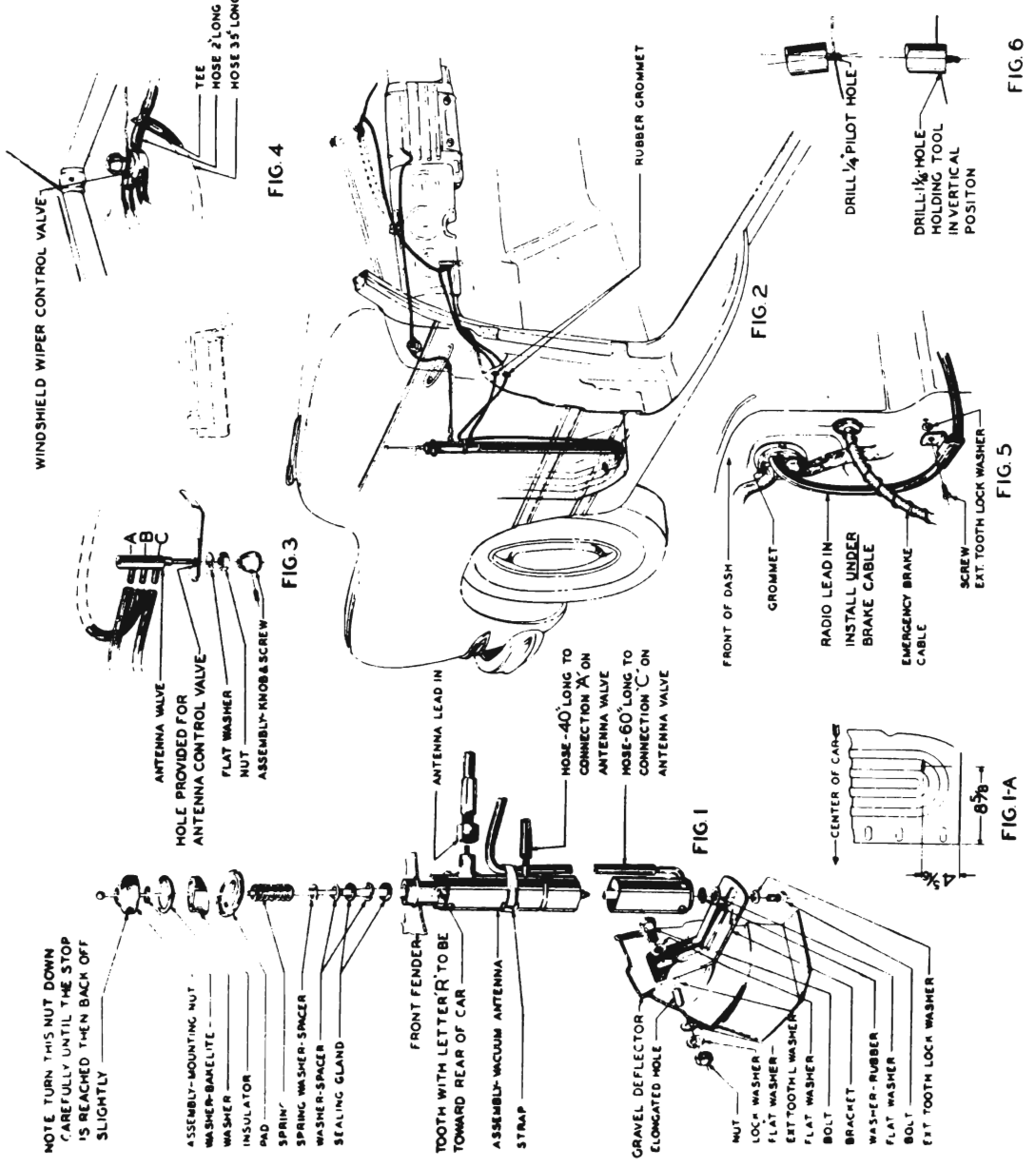


Fig. 12-107. Antenna Installation—Model 44-C

terminal on the end of the plug does not touch any "hot" terminal behind the instrument panel.

9. Install antenna "stop" in location shown and tighten screw securely. (Fig. 12-104D.) If antenna rod does not snap into antenna "stop" easily, spline head adjustment screw can be turned in against polished ring to vary clearance between rod and center strip. Tension should be sufficient, however, to prevent rod from rattling. This adjustment should **not** be used except for a very slight change. See operation 5.

Antenna Part No. 980696—
Used on Models 56C-76C

The installation of the antenna on Models 56C and 76C is very similar to that on closed bodies.

The assembly of the "Control Knob" is clearly shown in Fig. 12-106. Make certain that screw holding knob assembly in place is tightened securely.

Position the antenna control assembly until the end of the outside tube is 1½" from the top of the outside windshield center strip in place of 7/16" as on the closed bodies.

Vacuum Antenna Part No. 980689—
Used on Model 44C

The installation of the Vacuum Antenna is shown in Fig. 12-107, and the sequence of operations given should be followed.

The slotted holes in the mounting bracket permit the antenna to be set in the vertical position or tilted slightly back.

INSTALLATION OF RECEIVER

NOTE: Remove paper behind radio grille before installing radio. (See Fig. 12-109.) This is very essential and if not done will result in very unsatisfactory radio performance. Make certain that all paper which is not securely cemented to instrument panel is removed. Loose edges will buzz when radio is played.

The control plate covering the opening in the instrument panel can be pried off by inserting a screw driver under the edge. The plugs in the openings for the tuning and tone control may be removed in the same manner.

Make sure the inside surface of the instrument panel is clean around the radio mounting holes so as to establish a good electrical connection with the receiver.

Figs. 12-109 and 12-110 illustrate the proper relationship of the parts used in assembling the radio hangers and radio to the instrument panel. While Figs. 12-109 and 12-110 show only the left side, the right side is identical with the exception of the wiring.

Radio hangers should be bolted in place with the slot openings toward the front of the car. Hangers for Series 40-60-90 are not interchangeable with Series 50-70.

The receiver can best be installed by sitting in the front seat holding receiver at arms length while the two threaded bushings are inserted through the instrument panel and grille, hooking the studs on sides of receiver over the extending lips on the hangers.

Tighten the two hex nuts which hold receiver to panel. Hold set up with hand until rubber gasket touches the back of the instrument panel, then tighten nuts on hangers. Do not force set against instrument panel.

When installing radio on Series 50-70 equipped with sheet metal grille, it will first be necessary to place hex nut No. 1320547 on radio mounting studs and screw on firmly against large nut on mounting stud. (Fig. 12-108.) This acts as a

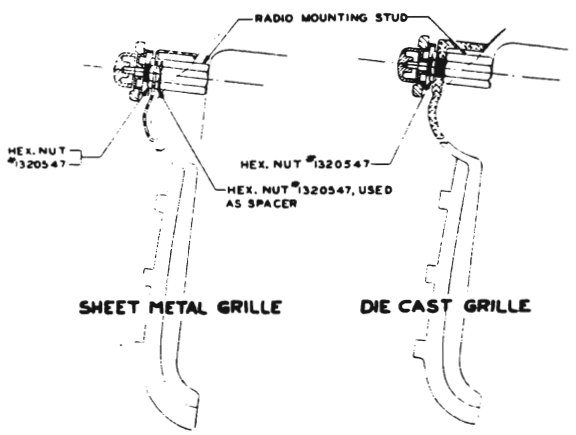


Fig. 12-108. Radio Installation—Sheet Metal Grille—Series 50-70

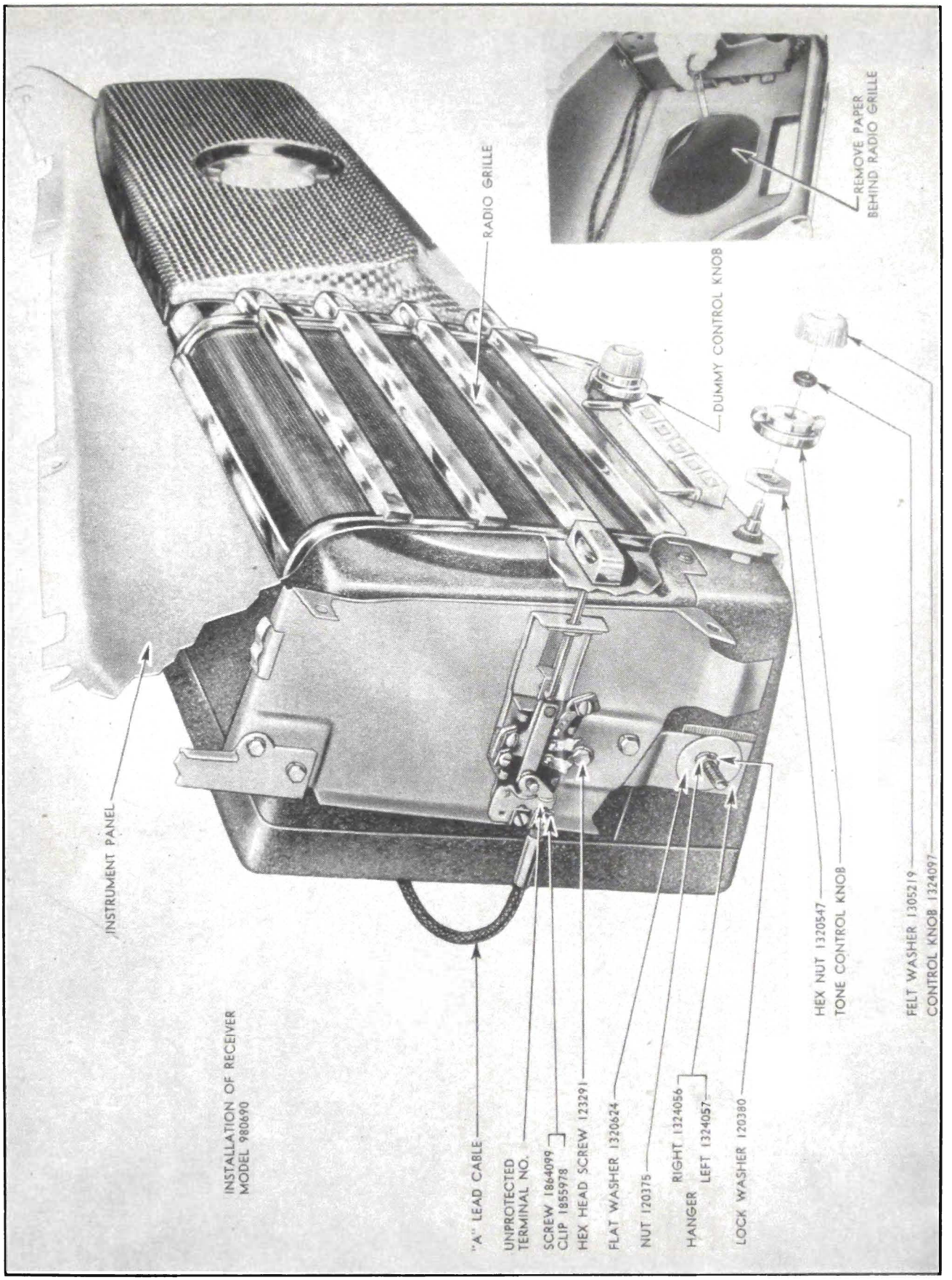


Fig. 12-109. Proper Method of Attaching Radio to Instrument Panel—Series 40-60-90

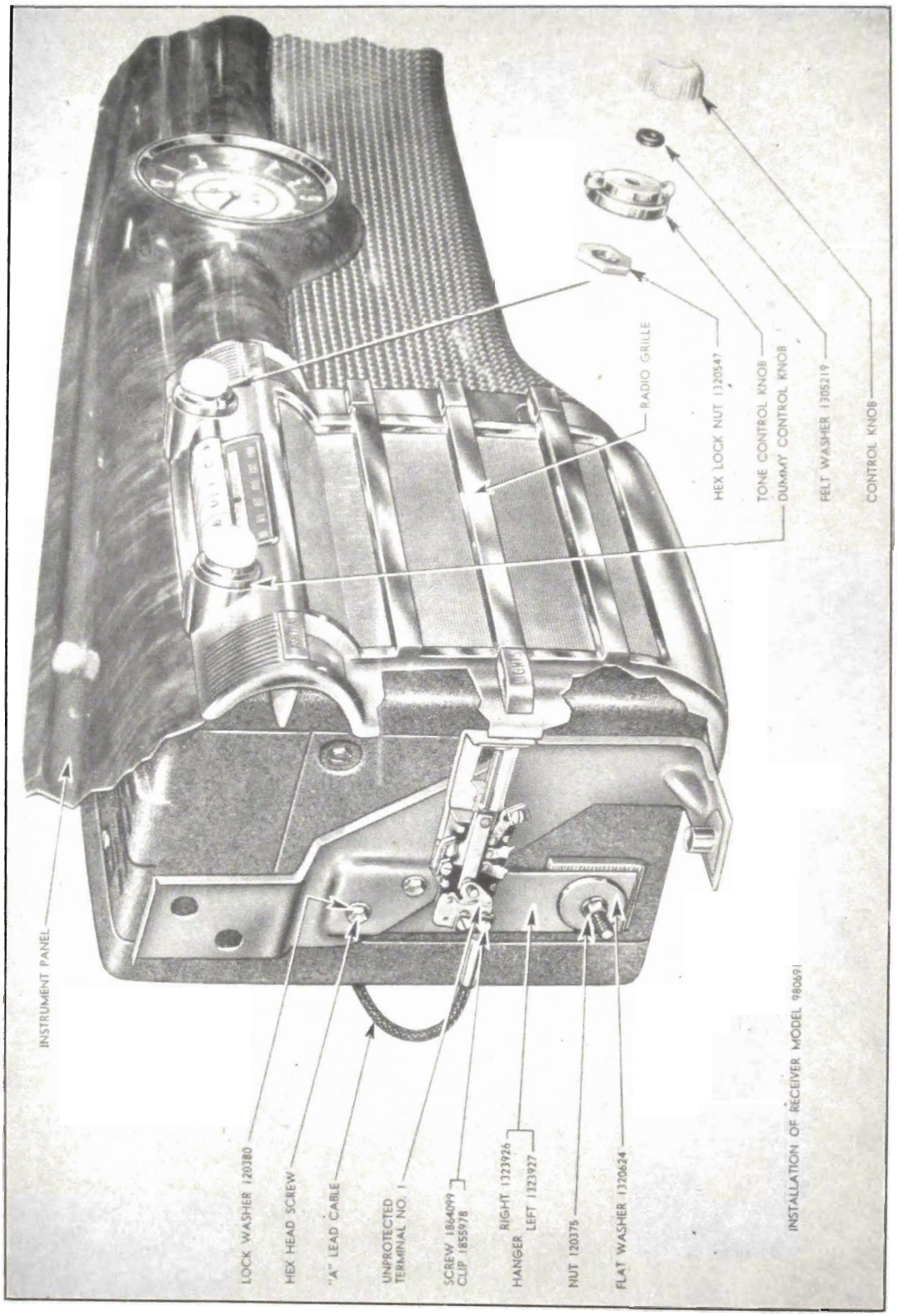


Fig. 12-110. Proper Method of Installing Radio to Instrument Panel—Series 50-70

spacer between radio and grille to take up the difference in thickness between sheet metal and die cast grilles. This spacer nut should not be used on cars equipped with die cast grille, or on Series 40-60-90.

For correct relationship of control knobs, "A" lead connection, and other attaching parts, see Fig. 12-109 for Series 40-60-90, and Fig. 12-110 for Series 50-70. The "A" lead is connected to one of the end terminals of the light switch as shown. Be sure the No. 1 (unprotected) terminal is used.

Fig. 12-113 shows the location of the fuse and the bayonet connection of the "A" lead and "lead-in" connection for Series 40-60-90 Radio. See Fig. 12-111 for Series 50-70.

The "lead-in" plug is pushed into the receptacle on the back of the receiver. Make sure that rubber nipple does not hold this terminal out.

Important—Antenna Adjustment

After the installation of both antenna and receiver has been completed, the antenna coil in the receiver should be matched to the car antenna. This is done by adjusting the antenna trimmer screw. (See Figs. 12-111 and 12-113.)

Pry out plug button; raise antenna to maximum height; tune radio to a station between 1300 and 1500 K.C. that can barely be heard with volume turned full on; adjust trimmer screw carefully back and forth and leave in position giving maximum output.

CAUTION: Make certain plug button is replaced after adjustment to prevent ignition interference.

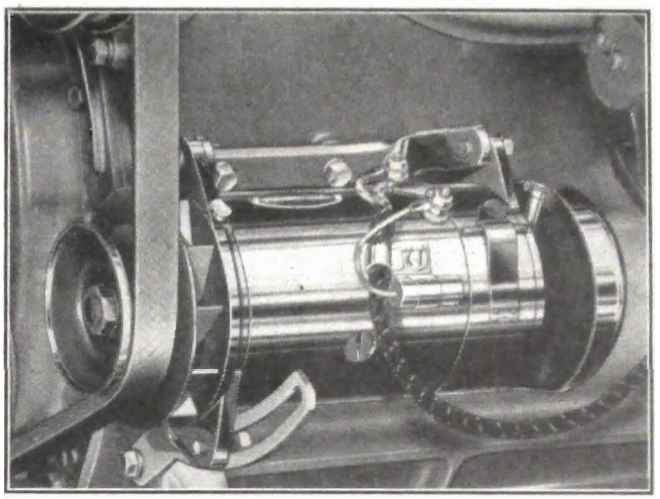


Fig. 12-112. Condenser Mounted on Generator

INTERFERENCE SUPPRESSION

Fig. 12-112 illustrates the manner in which the condenser should be installed to prevent interference caused by the generator. This condenser should never be connected to the other terminal (Field) as this will cause bad pitting of the voltage regulator points, thus preventing it from operating properly.

The distributor suppressor should be installed on the center wire of the distributor. Installation of the suppressor on the coil end of this wire does not give satisfactory results.

Fig. 12-38 illustrates the proper method of removing the coil end cover making it possible to install the condenser for eliminating interference from the coil.

Fig. 12-35 shows the condenser installed. Be sure that soldering makes a good electrical connection.

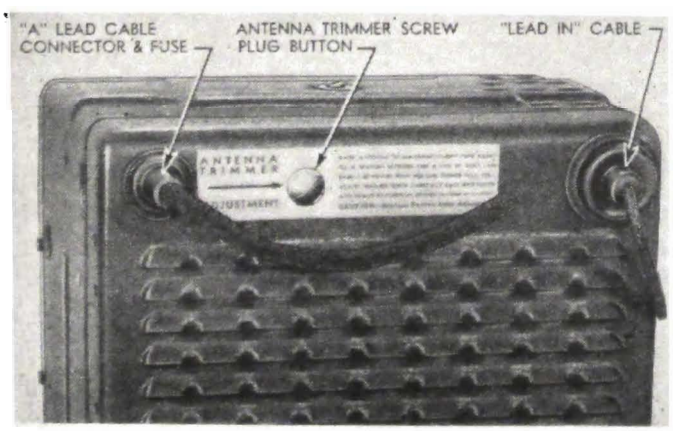


Fig. 12-111. Antenna Trimmer Screw Location—Series 50-70

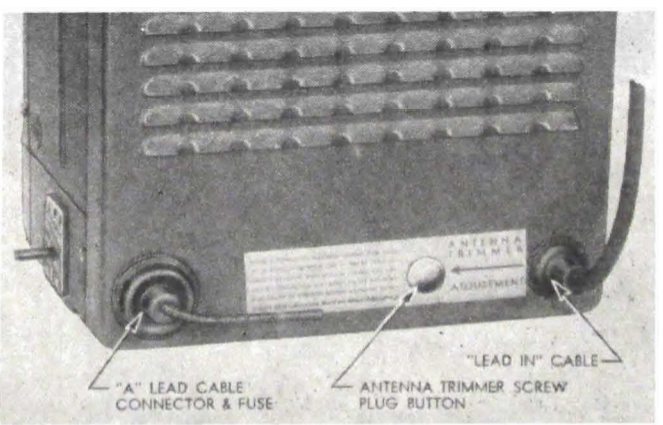


Fig. 12-113. Antenna Trimmer Screw Location—Series 40-60-90

WARNING! Do not attempt to connect this condenser to the terminal on the outside of the coil or distributor as this will result in damaging the distributor points and will cause erratic engine performance.

Ignition coils equipped with radio condensers are marked on the mounting bracket with the word "Radio."

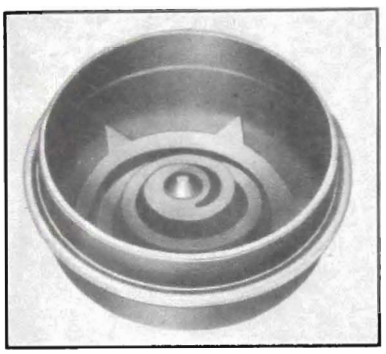


Fig. 12-114. Static Collector Installed in Front Wheel Dust Cap

Fig. 12-114 covers the static collector installation in the dust caps of the front wheels. For good results the dust cap and the center of the front wheel axle must be clean and free from grease. The center of the collector is made of self-lubricating material.

CAUTION

The 1942 Buick generator output is controlled by an automatic voltage and current regulator. No manual adjustment is provided. Do not disturb regulator adjustment. See Voltage and Current Regulator.

OPERATING INSTRUCTIONS

Antenna

The closed body antenna as well as the antenna for Models 56C and 76C is operated by rotating knob in either direction. In metropolitan sections, with strong broadcasting stations, the radio will operate with antenna rod in "down" position. Weaker stations will require the antenna to be raised to the upright position and fully extended. The extensions must be pulled out manually.

These antennæ are hinged so that they will not ordinarily be damaged when coming in contact with low hanging limbs or other obstructions. The hinge allows the antenna to yield forward and backward. The antenna returns to its normal position automatically as soon as the obstruction is passed.

The vacuum operated antenna used on Model 44C when fully extended is longer and very flexible, allowing it to pass obstructions freely. The lower section of this antenna is controlled by valve on lower left side of instrument panel. To raise antenna, push knob up; to lower antenna pull knob down. The two top sections must be raised and lowered manually.

Switch and Volume Control

The first portion of rotation in a clockwise direction turns on the radio. Further rotation increases volume.

Tone Control—Chrome Plated Konb Behind Volume Control Knob

Control in extreme "treble" position gives brilliant reproduction of the full tone range. This position will reproduce speech very clearly and distinctly. Rotation counter-clockwise (toward "bass") diminishes brilliance and accentuates low notes.

Tuning Control

When tuning manually, or when setting up a station on one of the buttons, remember: "A good radio properly tuned will give the utmost in radio reception, while the same radio improperly tuned may be quite unsatisfactory."

If the program sounds screechy or distorted, it is probably caused by improper tuning and can be corrected by adjusting the tuning knob slightly. Since the low notes are more affected by tuning than the high ones, it is a good plan to tune the set to a point where the low notes are heard best and high notes are clear but not screechy. Turning the control knob back and forth until the station is almost lost on either side will enable the operator to hear the differ-

ence in reception and select an intermediate position giving best results.

Push Buttons

To operate the push buttons, simply push the buttons in as far as possible. The button travels very easily for a ways and then a slightly harder push is necessary to complete the travel. It is suggested that the operator try tuning with the buttons a few times while the car is standing still so that he can watch the pointer move across the dial, and thus get to know the "push" necessary to operate the tuning mechanism.

Fig. 12-115. Removing "Push Button" (Also see Fig. 12-116)

Setting up the push buttons to the desired stations is a simple procedure requiring no tools or equipment.

1. Turn on the radio.
2. Remove the button by shifting the spring which is located on the bottom of each button, sidewise and pulling straight out. See Fig. 12-115.

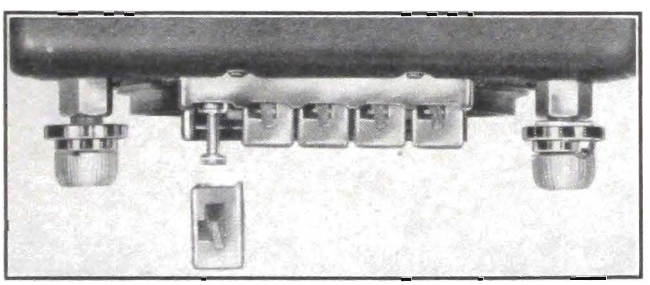


Fig. 12-116. Removing "Push Button" (Also see Fig. 12-115)

3. Loosen screw as shown in Fig. 12-117.
4. Push loosened screw in as far as possible and hold in this position with left hand while the right hand is used to tune in the desired station. See paragraph entitled "Tuning Control," page 12-78. Do this carefully because, if incorrect the error will repeat each time the push buttons are used.

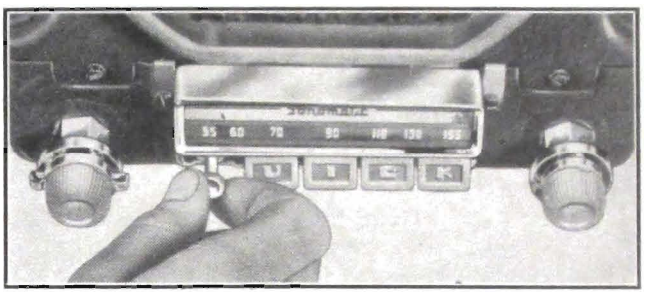


Fig. 12-117. Loosening or Tightening Screw

5. Remove pressure from screw so that it comes back to normal position. Tighten screw as shown in Fig. 12-117.
6. Replace button by pushing in as far as possible. (The spring will prevent it from coming off unintentionally.)

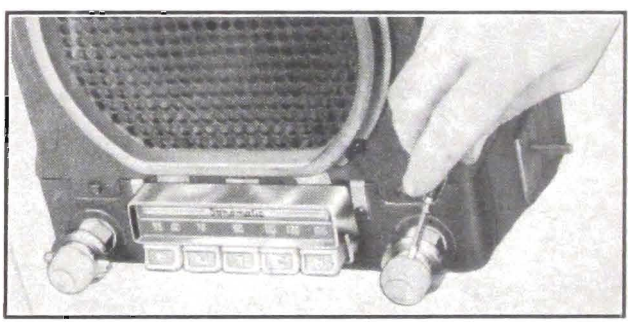


Fig. 12-118

NOTE: To remove control knobs from the shafts insert a small screwdriver in the slot provided in each knob and pry against the flat spring located inside of the knob. (See Fig. 12-118.) To install: Push knob on as far as possible.

PACKAGE CONTENTS—CARTON NO. 980690

Series 40-60-90

No. Req'd	Part No.	Part Name
1	7242300	Radio Receiver (only) (In Package 980690)
		PACKAGE NO. 1
2	1324097	Assembly, Knobs—Radio Control
2	1305219	Washer, Felt
1	1320576	Knob, Radio Tone Control
1	1326261	Knob, Radio Tone Control (1326261 is optional when 1320576 is not available)
1	1320577	Knob, Dummy Radio
1	1326262	Knob, Dummy-Radio (1326262 is optional when 1320577 is not available)
2	1320547	Nut, Special Hexagon (Radio to Instrument Panel)
		PACKAGE NO. 2
1	1321177	Assembly, "A" Lead Cable
1	120151	Fuse
		PACKAGE NO. 3
2	1286759	Static Collector
		PACKAGE NO. 4
1	1880659	Generator Condenser
1	1879526	Coil Capacitor
1	1207820	Distributor Suppressor
1	1853686	Suppressor Adapter
		PACKAGE NO. 5
1	1324056	Hanger (Right)
1	1324057	Hanger (Left)
2	1320624	Washer, Flat (Receiver to Hanger)
6	120380	Washer, Lock ¼" Medium (Cadmium or Zinc Plated)
4	123291	Screw, Hexagon Head ¼"-28 x $\frac{5}{16}$" (Cadmium or Zinc Plated)
2	120375	Nut, ¼"-20 Hexagon (Cadmium or Zinc Plated)

PACKAGE CONTENTS—CARTON NO. 980691

Series 50-70

No. Req'd	Part No.	Part Name
1	7242299	Radio Receiver (only)
		PACKAGE NO. 1
2	1324097	Assembly, Knobs—Radio Control
2	1305219	Washer, Felt
1	1326146	Knob, Radio Tone Control (Sheet Metal Grille)
1	1326259	Knob, Radio Tone Control (1326259 is optional when 1326146 is not available)
1	1320576	Knob, Radio Tone Control (Die Cast Grille)
1	1326261	Knob, Radio Tone Control (1326261 is optional when 1320576 is not available)
1	1320577	Knob, Dummy-Radio (Die Cast Grille)
1	1326262	Knob, Dummy-Radio (1326262 is optional when 1320577 is not available)
1	1326147	Knob, Dummy-Radio (Sheet Metal Grille)
1	1326260	Knob, Dummy-Radio (1326260 is optional when 1326147 is not available)
4	1320547	Nut, Special Hexagon
		PACKAGE NO. 2
1	1321178	Assembly, "A" Lead Cable
1	120151	Fuse
		PACKAGE NO. 3
2	1286759	Static Collector
		PACKAGE NO. 4
1	1880659	Generator Condenser
1	1879526	Coil Capacitor
1	1207820	Distributor Suppressor
1	1853686	Suppressor Adapter
		PACKAGE NO. 5
1	1323926	Hanger (Right)
1	1323927	Hanger (Left)
2	1320624	Washer, Flat (Receiver to Hanger)
6	120380	Washer, Lock ¼" Medium (Cadmium or Zinc Plated)
4	123291	Screw, Hexagon Head ¼"-28 x $\frac{5}{16}$" (Cadmium or Zinc Plated)
2	120375	Nut, ¼"-20 Hexagon (Cadmium or Zinc Plated)

SERVICE INSTRUCTIONS

Package No. 980690 and 980691—Set only No. 7242300 and 7242299

General

Mounting—Model 980690 on all 40-60-90 cars.
Model 980691 on all 50-70 cars.
Tubes—Six.
Speaker—8" Electro Dynamic.
Tuning—Manual and 5 Push Buttons Mechanical with electric clutch.
Tuning Range—550-1600 K.C.

Push Button Set-Up

Release holding spring in bottom of button, pull button off. Loosen reset screw, tune in desired station. Push in reset screw until it bottoms. Release and tighten screw. Replace button.

NON-TECHNICAL TROUBLE-SHOOTING

The following analysis will serve as a guide in locating and becoming familiar with minor repair problems.

(1) Antenna

An antenna can cause a radio to be weak, dead, noisy or intermittent. The easiest method of checking antenna is to substitute a piece of wire about 10 feet long in place of antenna, at end of a standard antenna lead-in, and place outside and away from the car. If radio operates near normal with substitute antenna, some part of car antenna or lead-in is at fault. Check continuity of antenna and lead with ohmmeter or click method.

CAUTION: **Do not check with lamp or any device drawing current, as conductor inside loom is small in diameter and will burn off if checked in this manner.**

To check for noisy or intermittent operation in antenna or lead-in, proceed as follows:

With antenna fully extended and volume control of radio turned on full, if noise appears in speaker check antenna and lead for loose connections; if wiggling lead does not cause noise, rap antenna rod with insulated end of screwdriver; if noise appears, check antenna for shorting to car body or corrosion between antenna sections. Screws holding center strip of windshield should be checked to see that they have not pierced insulation of lead-in shorting it to car body.

(2) Tubes

Tubes can cause radio to be dead, weak, intermittent or distorted. Before checking tubes, make sure that they are all firmly pressed in socket. Tap each tube with handle of light screwdriver with volume control wide open, and replace any tube that causes noise in speaker. Replace tubes in set with tubes known to be good, one at a time (allowing about 45 seconds to heat up) until the defective one is found.

(3) Fuse

Blown fuses are usually caused by sticking vibrator. Replace with 15 ampere fuse and turn switch on and off several times and if fuse does not blow the vibrator usually is O.K.

(4) Vibrator

If when the radio is turned on vibrator does not start, check fuse and if it is O.K. replace vibrator. If vibrator buzzes unevenly or very loud, replace it with a new one.

(5) Tire or Wheel Static

This noise is electrical charges collecting on the wheels, then discharging to the road surface through the tires. The surface of the road determines the strength of discharge. Wheel or tire static very seldom occurs on gravel or dirt roads. This static in mild form shows up as a click in radio and increases with speed. Apply brakes lightly and if noise decreases check front wheels to see that static collectors have been properly installed and make sure that all grease has been wiped off contacts. In certain cases of wheel or tire static, these static collectors alone may not completely eliminate all noise from this

source. The U. S. Rubber Company has developed a powder, known as U. S. Automotive Static Neutralizer, which equalizes the positive and negative charges developed by the tire, thus neutralizing the corona effect and eliminating radio interference difficulties from this source. This material has been thoroughly tested in all sections of the country and has been found very successful in treating complaints of radio interference due to tire or wheel static. This material is now being merchandized by U. S. Rubber Company and is available through their distributors.

(6) Generator Noise

The sparking of the generator brushes will produce a noise in the radio which increases with speed. This noise is identified by a high-pitched whine. Check generator condenser to see that all connections are tight and that paint under condenser mounting has been removed. If these are in good condition replace condenser with new one. Remove generator cover band and observe sparking. If this is excessive, check for open armature.

(7) Ignition Interference

Trouble from this source should not occur when distributor suppressor and coil condenser have been properly installed as covered under "Interference Suppression" in Installation and Operating Instructions. If they are found to be properly installed, replace with new parts, one at a time until defective unit is found. Make sure that all distributor wires and high tension wire to coil are pushed firmly in their sockets. Check lead-in where it is fed up through hole in center of instrument panel and see that bare metal shielding protrudes through hole in panel about ¼". Also, that clip holding lead to instrument panel has been properly installed as covered under "Antenna Installation." Make sure that car hood is latched securely when making checks for ignition interference.

COMPLETE ALIGNMENT PROCEDURE

These instructions must be adhered to rigidly and all adjustments made in the order listed. The following general discussion supplements the brief instructions which precede the tabulated alignment procedure.

(1) Alignment Preliminaries

The radio receiver should be functioning before the various aligning adjustments are made. Trouble shooting, if necessary, should **precede** the final adjustment. Receiving signals at correct dial setting depends upon having the proper relation between tuning condenser and the dial scale. Pointer or dial setting is necessary because the scales are not linear with frequency and all scales are precalibrated for maximum accuracy. **Under no circumstances should alignment be attempted without calibrated test oscillator and output meter or by untrained personnel.**

(2) Superheterodyne Theory and Alignment

Buick Sonomatic Auto Radios employ the superheterodyne circuit which uses an intermediate frequency (I-F) amplifier, the characteristics of which largely govern the selectivity of the receiver. The I-F amplifier characteristics are determined principally by the adjustment and design of the I-F transformers. It is, therefore, important that the I-F amplifier be correctly adjusted to provide the best selectivity. These adjustments are in the form of iron cores placed within the coils. During alignment it is necessary only to adjust these iron cores as specified in the tabulated alignment procedure, to obtain best operation. Incorporated in every superheterodyne is a local oscillator, the output of which mixes with the incoming signal from the antenna. The local oscillator does not operate at the same frequency as the incoming signal which is to be received. The resonant (acceptance) frequency of the I-F amplifier establishes the difference in frequency required; 260 K.C. is used on Buick radios. The local oscillator operates at a frequency higher than the incoming signal, the two predominating resultant frequencies produced are the sum and the difference of the two frequencies. The design of these receivers is such that the difference in frequency is the same as the I-F amplifier resonant frequency. Modulation of the incoming signal will be present as modulation of input to the I-F amplifier.

(3) Effects of R-F or I-F Misalignment

The effects of misaligned R-F or I-F stages are most commonly observed as a loss of sensitivity either over a portion or over entire band; loss of sensitivity, often characterized by the selectivity being noticeably unequal on the two sides of the point of best reception; change in fidelity; and inaccurate dial readings. Loss of fidelity will be apparent as a loss of high or low audio frequencies. If the I-F amplifier is not tuned to the specified frequency, the oscillator and other tuned circuits will not track. The dial readings will then be incorrect and a portion of the band will have low sensitivity.

(4) Test Oscillator Connections— Dummy Antenna Use

The chassis or frame of the radio receiver is considered as being at ground potential and the "O" or "GND" terminal of the test oscillator should be connected to the chassis wherever good contact can be established. The "ANT" or "HIGH" terminal of the Test Oscillator output must be connected to the antenna connector or other points in the radio receiver as specified in the Alignment Procedure. The use of a fixed condenser in series with the test oscillator lead is specified in some instances. A .1 mfd. condenser is used in aligning the I-F stages and a .00006 condenser is used in series with the antenna connector. This condenser, sometimes called a "Dummy Antenna," provides the proper input loading to the receiver. It is important that this condenser be connected at the point where the Test Oscillator lead joins the radio set, and should not be connected at the test oscillator. In order to provide d-c bias to the tubes, the grid caps should be left connected if test oscillator connection is also made. Shielded leads should be used.

(5) Output Meter Connections

Any standard type of output meter can be employed during alignment. The meter should be connected across the secondary of the output transformer. It is best to leave the voice coil connected while using the output meter. It is essential that an Output Meter with sufficient sensitivity be used to avoid the possibility of using too much Test Oscillator Output to get a readable indication on the Output Meter. Sometimes it is desirable to connect the output meter from plate to plate of output tubes; when this connection is employed be sure that a .1 mfd. condenser is connected in series with the meter to afford protection from the d-c potential.

(6) Alignment of the Tuned Circuits

Tuning adjustments with trimmers or adjustable iron cores is accomplished while applying a modulated signal, of the specified frequency, to the input of the stage being adjusted. Maximum Output Meter indication, of the amplitude of Audio-Frequency output, of the radio receiver, shows when tuning is correct. The various tuned circuits are aligned by adjusting each in this manner. During all alignment adjustments, the output of the Test Oscillator must be kept as low as possible, consistent with a reasonable output meter indication, to prevent A-V-C action from taking place and making all adjustments seem very broad.

The tuning tool used must have a minimum of metal so it will cause little or no tuning reaction. If removing the tool, after making an adjustment, reduces the output appreciably, a slight compensating mistuning will correct the error and produce maximum output when the tool is removed.

(7) Rocking-In Adjustments

Provisions are incorporated in the Oscillator Circuit of Buick Superheterodyne receivers for a tracking adjustment at the low frequency end of the band. This consists of a variable magnetic core. Tuning frequencies specified in Alignment Procedure Table for making these adjustments should be carefully followed because the tuned circuit design is such that only this procedure will produce correct dial calibration.

For maximum sensitivity at the low frequency end of the band, this should be a rocking adjustment. To make a rocking adjustment, change the setting of the specified oscillator tracking magnetic core slightly, then tune the gang condenser for maximum output regardless of dial

setting, and note the exact reading of the output meter. Now repeat this procedure and note if the Output Meter reading so obtained is greater, or less than the first one. If the second reading is greater than the first, continue this process while changing the Oscillator tracking adjustment in the same direction until the highest possible output meter reading is obtained. If the second reading is less than the first, continue this process while changing the Oscillator tracking adjustment in the opposite direction until the highest possible output reading is obtained. The maximum amplitude setting which produces the most accurate dial calibration should be used.

This procedure increases the receiver sensitivity by effectively tuning the local Oscillator circuit simultaneously with the R-F and first detector stages at the low frequency end of the band. Simultaneous adjustment is necessary to maintain correct tracking. An adjustment at the low frequency end of a band should be followed by readjustments at the high frequency and because each tuning adjustment effects the other.

TABULATED ALIGNMENT PROCEDURE

Volume Control Maximum.
Test Oscillator Output minimum for satisfactory output indication.

Gang Condenser Setting	Series - Condenser or Dummy Antenna	Connect Test Oscillator to:	Test Oscillator Freq.	Adjust Screws in Order
Low Frequency End Dial	0.1 Mfd.	Grid side of R. F. Sec. (14B) of Gang Condenser	260 K.C.	ABCD
Extreme High Frequency End	0.1 Mfd.	Grid side of R. F. Sec. (14B) of Gang Condenser	1620 K.C.	E
1430 K.C.	.000060 Mfd.	Antenna Connector	1400 K.C.	FG
600 K.C.	.000060 Mfd.	Antenna Connector	600 K.C.	H
1430 K.C.	.000060 Mfd.	Antenna Connector	1400 K.C.	FG
600 K.C.	.000060 Mfd.	Antenna Connector	600 K.C.	H

Adjust trimmer G to match car antenna (between 1300-1500 K.C.) when radio is installed.

Special Instructions

Rock gang condenser back and forth through signal during 600 K.C. adjustment of trimmer H.

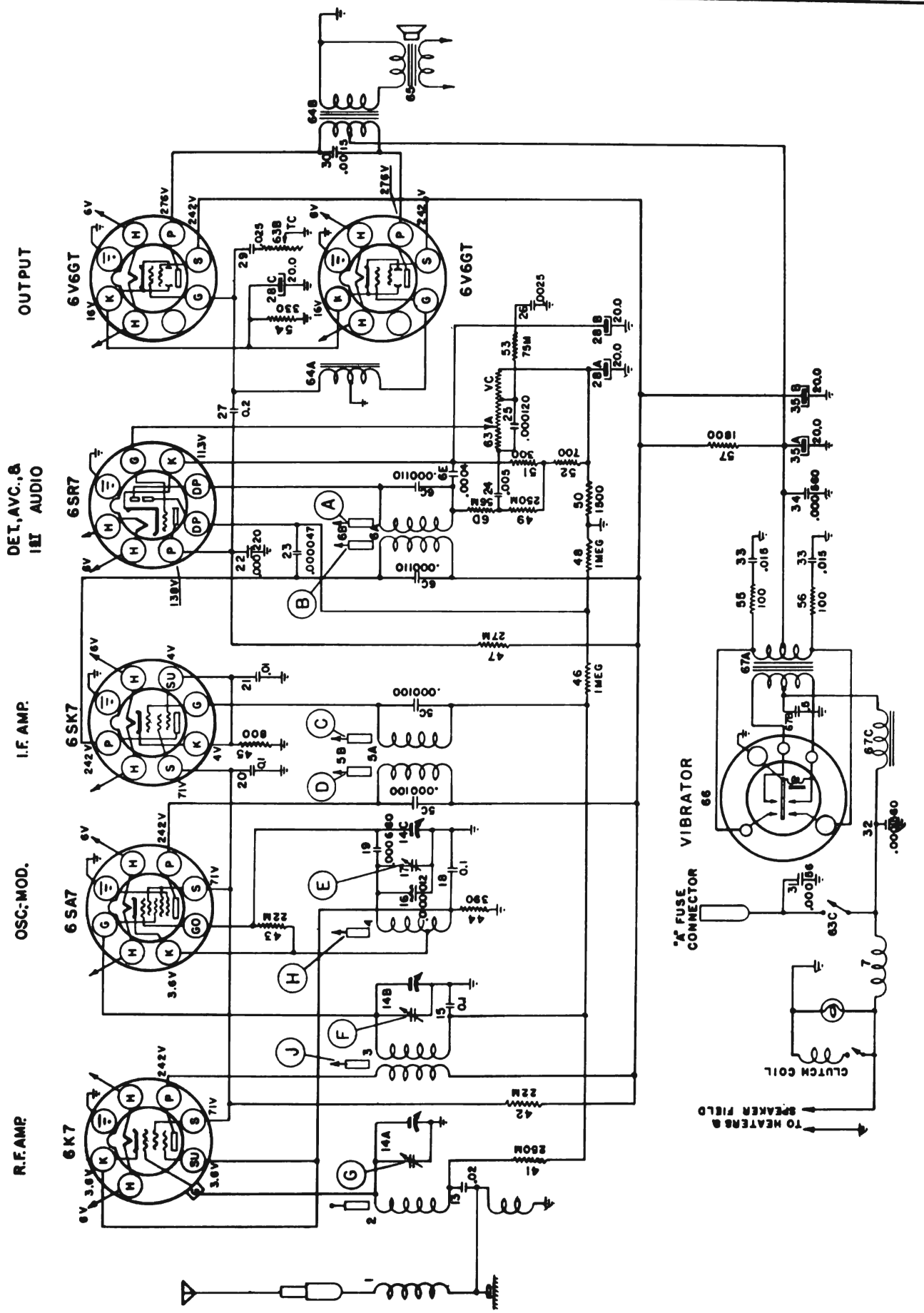


Fig. 12-119. Circuit Wiring Diagram

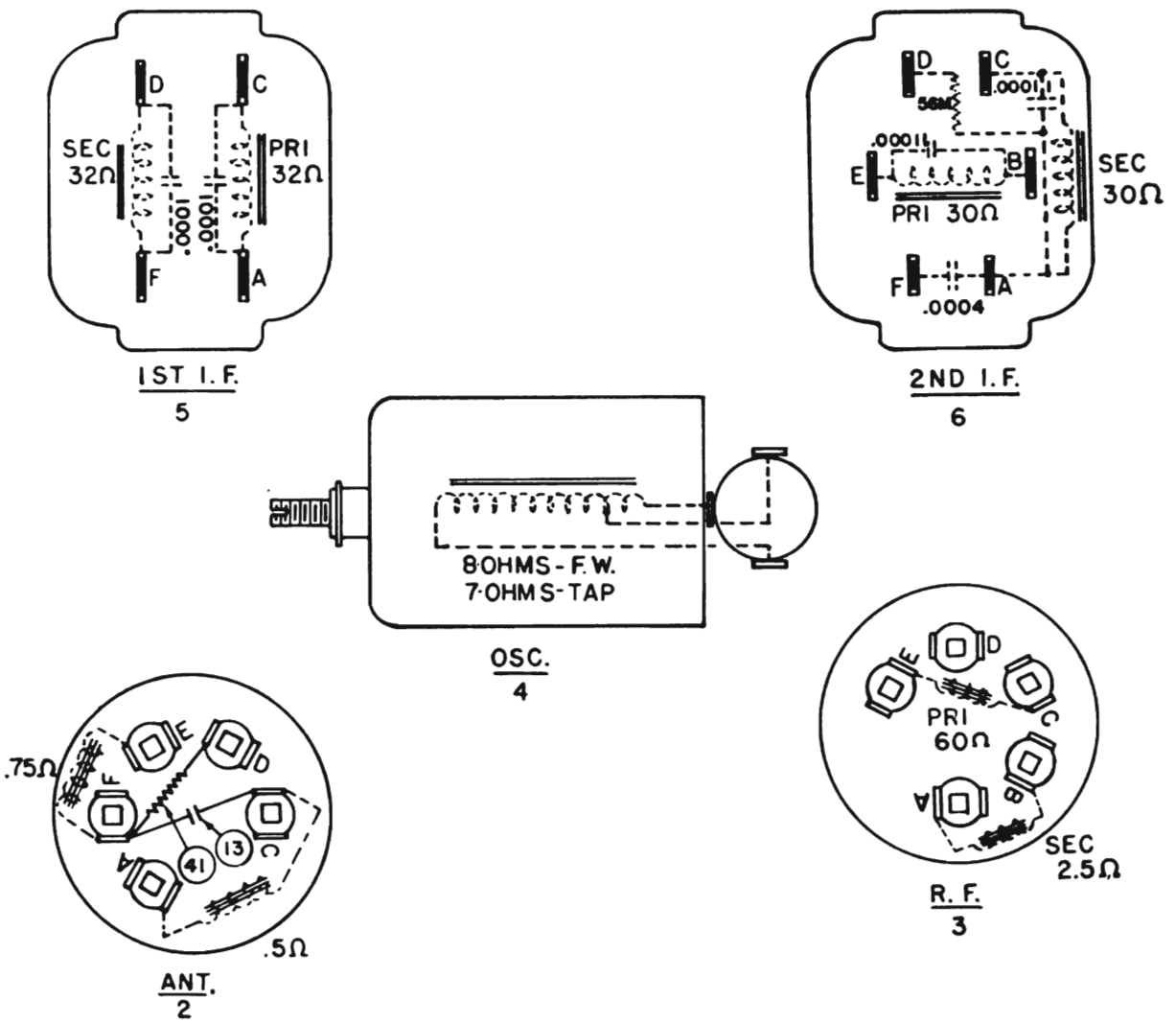


Fig. 12-120. Coil Connections

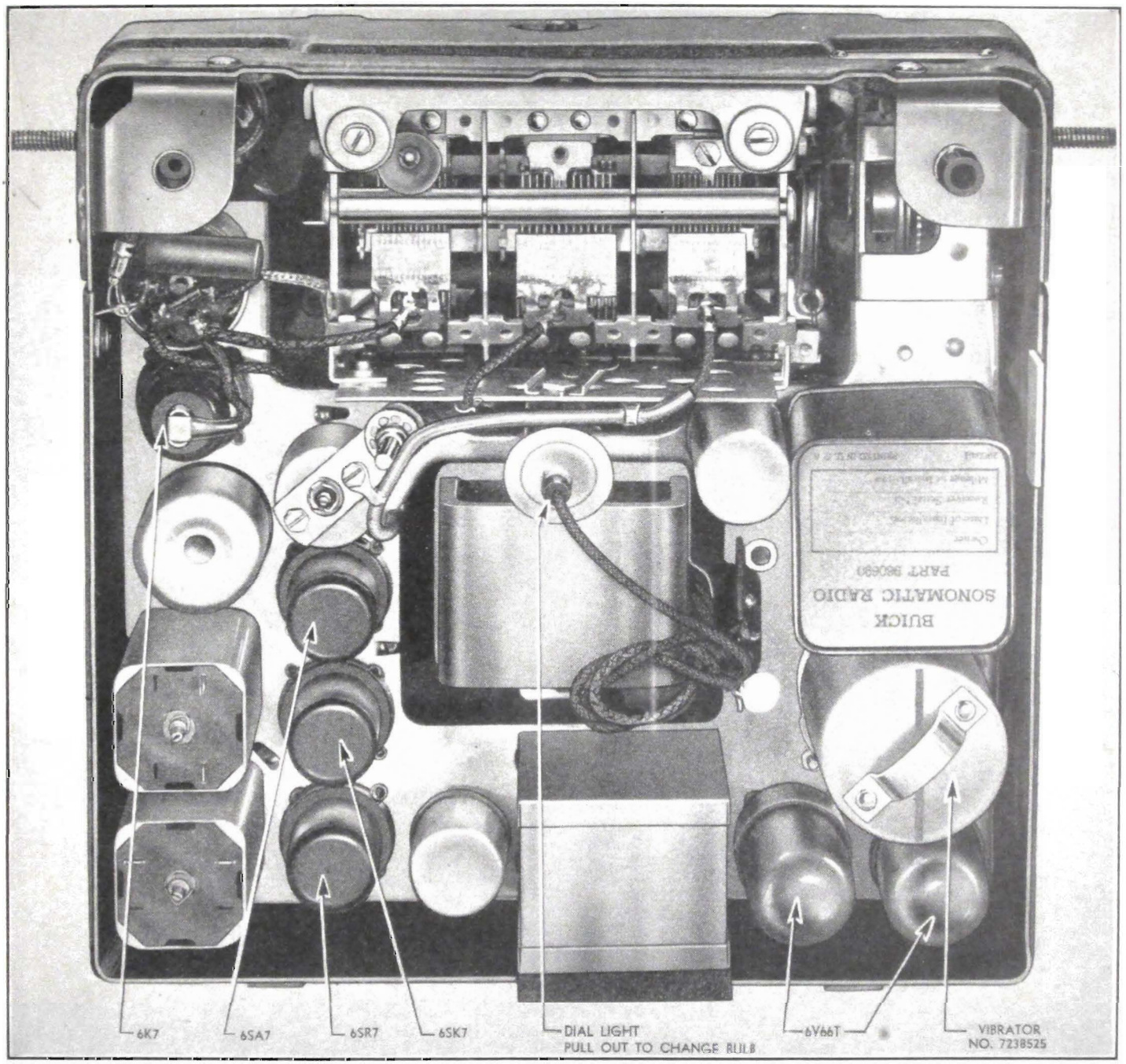
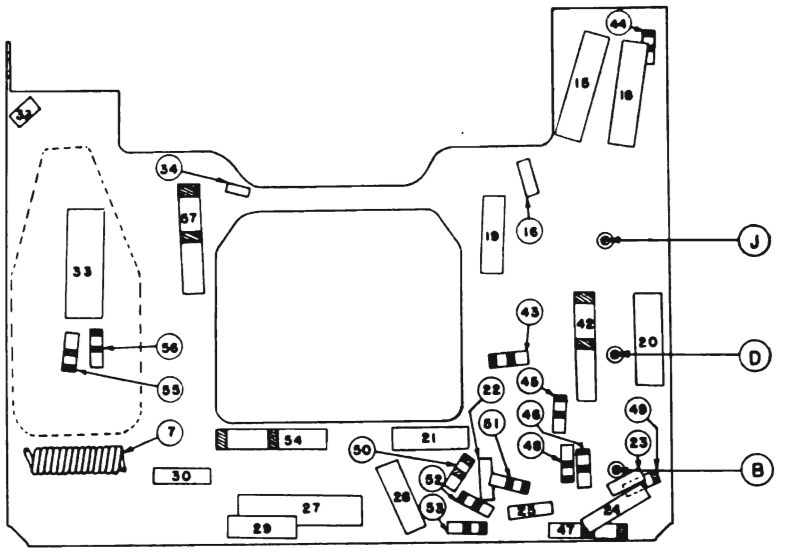
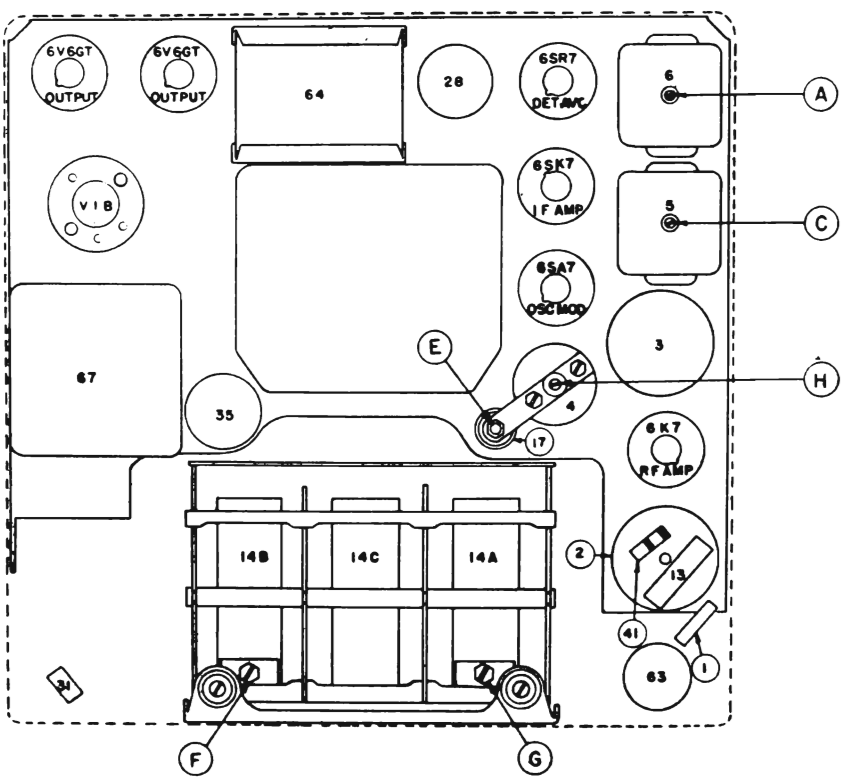


Fig. 12-121. Tube and Vibrator Location—All Series



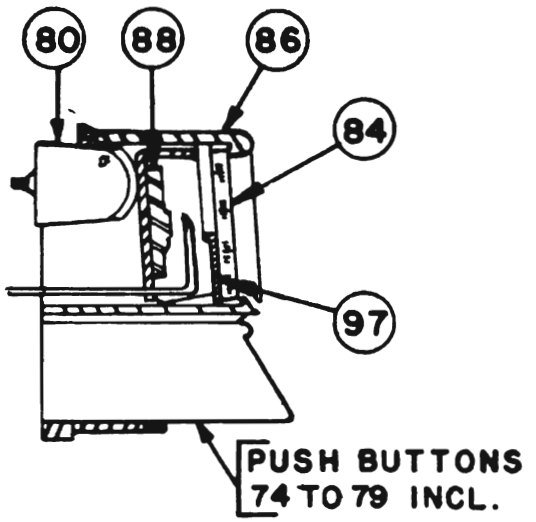
PARTS LAYOUT—CHASSIS VIEW

Fig. 12-122

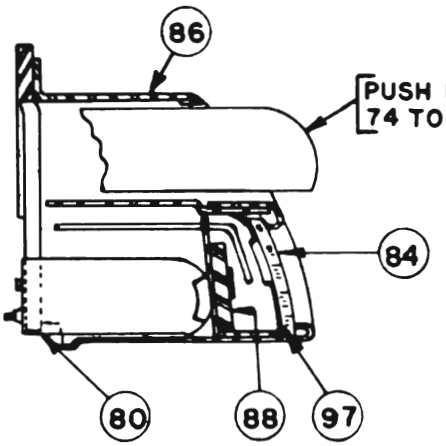


PARTS LAYOUT—TUBE VIEW

Fig. 12-123



MODEL 980690
ESCUTCHEON CROSS SECTION



MODEL 980691
ESCUTCHEON CROSS SECTION

Fig. 12-124

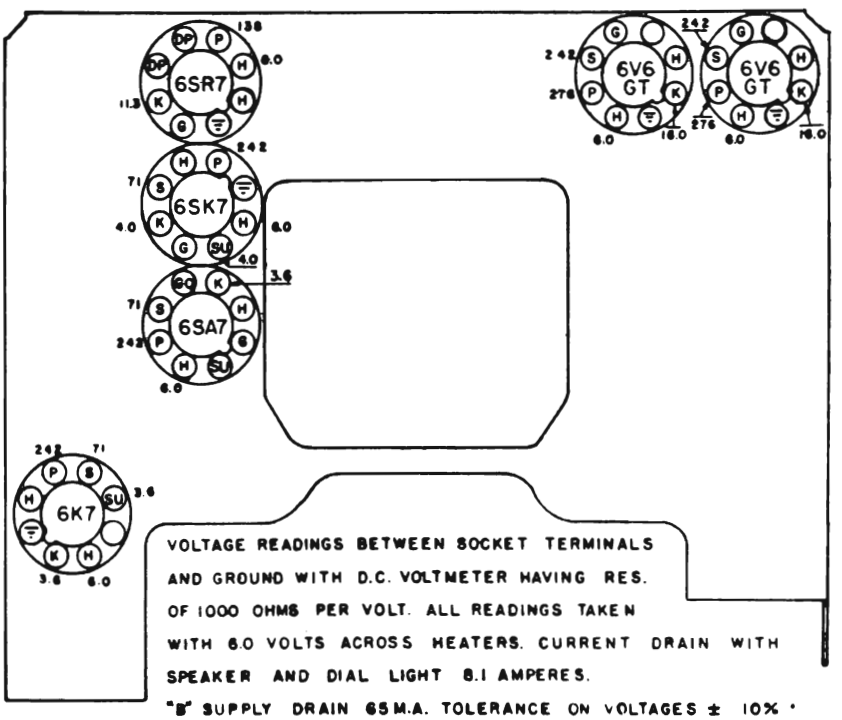


Fig. 12-125. Tube Socket Voltages

USING THE PARTS LIST

The example of a Parts List shown below gives the Illustration Number and then indented under the Illustration Number the section for the part such as "5" for the entire assembly and "5A" for the Iron Core and Stud.

You will note that we have indented both "5A" and Iron Core and Stud from the normal margin on that part of the Parts List to indicate that it is a part of the assembly of unindented part appearing above. If no part number is shown under the part number then that part is only replaceable as a part of the entire assembly. We believe that this method will indicate how these parts can be ordered in maintenance and in warranty and that it will serve to make the problem of ordering parts considerably easier.

PARTS LIST

Illustration No.	Part No.	Description
1	7240251	Antenna Choke Coil
2	7242232	Antenna Coil and Shield Assy.
3	7242238	R. F. Coil Assembly
4	7240406	Oscillator Coil Assembly
5	7242095	First I. F. Transformer Assy.
5A		Iron Core and Stud
5B		Coil
5C		.000100 Mfd. Molded Cond.
6	7242097	Second I. F. Transformer Assy.
6A		Iron Core and Stud
6B		Coil
6C		.000110 Mfd. Molded Cond.
6D		56000 ohm ½ watt Ins. Resistor
6E		.000400 Mfd. Molded Cond.
7	7241708	"A" Filter Choke

ETC.

It will be noted that all condenser capacities shown are in Mfd's.; to convert the smaller capacities into Mmf's., add a zero or zeros to the existing group to make six places to the right of the decimal point; example: .00025 Mfd. is equivalent to .000250 which can then be read as 250 Mmf.

All parts in Parts List available through United Motors Service.

RADIO SERVICE PARTS LIST
BUICK MODELS 980690 AND 980691
Chassis Electrical Parts

Coils

Illustration No.	Part No.	Description
1	7240251	Antenna Choke Coil
2	7242232	Antenna Coil and Shield Assy.
3	7242238	R. F. Coil Assembly
4	7240406	Oscillator Coil Assembly
5	7242095	First I. F. Transformer Assy.
5A		Iron Core and Stud
5B		Coil
5C		.000100 Mfd. Molded Cond.
6	7242097	Second I. F. Transformer Assy.
6A		Iron Core and Stud
6B		Coil
6C		.000110 Mfd. Molded Cond.
6D		56000 ohm ½ watt Ins. Resistor
6E		.000400 Mfd. Molded Cond.
7	7241708	"A" Filter Choke

Condensers

Illustration No.	Part No.	Description
13	1212099	.02 Mfd. 600 V. Tubular
14	7242576	3 Gang Tuning
14A		Antenna Section
14B		R. F. Section
14C		Oscillator Section
15	1207908	0.1 Mfd. 400 V. Tubular
16	7242450	.000012 Mfd. Compensating
17	7235991	Oscillator Trimmer Condenser
18	1207908	0.1 Mfd. 400 V. Tubular
19	7236151	.000660 Mfd. Silvered Mica
20	1207908	0.1 Mfd. 400 V. Tubular
21	1208600	.01 Mfd. 600 V. Tubular
22	7231178	.000200 Mfd. Molded
23	1207625	.000050 Mfd. Molded
24	7230912	.005 Mfd. Tubular 800 V.
25	7240577	.000120 Mfd. Molded
26	7240578	.0025 Mfd. 800 V. Tubular
27	7240579	0.2 Mfd. 400 V. Tubular
28	7238553	Electrolytic 3 Section
28A		20 Mfd. 25 V.
28B		20 Mfd. 25 V.
28C		20 Mfd. 25 V.
29	1211232	.025 Mfd. 400 V. Tubular
30	7236134	.0015 Mfd. 800 V. Tubular
31	7240566	.000560 Mfd. Mica
32	7240566	.000560 Mfd. Mica
33	7236075	.015 x .015 1500 V. Dual Tubular
34	7240566	.000560 Mfd. Mica
35	7240612	Electrolytic 2 Section
35A		20 Mfd. 400 V.
35B		20 Mfd. 400 V.

Resistors

Illustration No.	Part No.	Description
41	1210117	250,000 ohms ½ W. Ins.
42	7240590	22,000 ohms 2 W. Ins.
43	1214550	22,000 ohms ½ W. Ins.
44	1213482	390 ohms ½ W. Ins.
45	1211029	800 ohms ½ W. Ins.
46	1209885	1 Megohm ½ W. Ins.
47	7236080	27,000 ohms 1 W. Ins.
48	1209885	1 Megohm ½ W. Ins.
49	1210117	250,000 ohms ½ W. Ins.
50	1211041	1,500 ohms ½ W. Ins.
51	1211220	300 ohms ½ W. Ins.
52	1211024	700 ohms ½ W. Ins.
53	1210832	75,000 ohms ½ W. Ins.
54	7240562	330 ohms 2 W. W. W.
55	1211000	100 ohms ½ W. Ins.
56	1211000	100 ohms ½ W. Ins.
57	7241052	1,800 ohms 2 W. W. W.

Miscellaneous Electrical Parts

Illustration No.	Part No.	Description
	7241967	(Model 980690—Controls at bottom only)
63	7241928	(Model 980691—Control at top) Volume and Tone Control with Switch
63A		Volume Control
63B		Tone Control
63C		Switch
64	7240464	Audio Pack—Driver and Output Transformer
64A		Driver Transformer
64B		Output Transformer
65	7240469	Speaker—8" Dynamic
66	8630	Vibrator—Synchronous
67	7240519	Power Transformer Assembly
67A		Transformer Unit
67B		0.5 Mfd. 100 V. Condenser
67C		"A" Choke

Tuner, Dial and Escutcheon Mechanical Parts for Model 980690 (Controls at Bottom) Only

Illustration No.	Part No.	Description
73	7238502	Bushing—Insulating Dial Light Tube
74	7241965	Bushing—Manual Drive
75	7242221	Button—Push Button Assy. "B"
76	7242222	Button—Push Button Assy. "U"
77	7242223	Button—Push Button Assy. "I"
78	7242224	Button—Push Button Assy. "C"
79	7242225	Button—Push Button Assy. "K"
80	7238513	Clamp—Dial
81	7240471	Clutch Assembly
82	7242168	Cord and Link Assembly
83	7242167	Cord and Spring Assembly
84	7242173	Dial Glass
85	7240396	Drive Drum and Female Joint Leaf Assembly
86	7242457	Escutcheon
87	7240410	Lever—Declutching Switch
88	7240509	Plate—Pointer Backplate
89	7240415	Plate—Guide Assembly
90	7240299	Plate—Tuner Mounting R. H.
91	7240298	Plate—Tuner Mounting L. H.
92	7240460	Pointer and Tip Assembly
93	7242058	Pulley and Stud
94	7240368	Reset Screw
95	7240287	Shaft—Declutching Switch Lev.
96	7241981	Shaft—Manual Tuning
97	7240508	Shield—Dial
98	8240292	Spring—Declutching Switch Lev.
99	7238950	Spring—Plunger Return
100	7237174	Spring—Universal Joint
101	7242551	Spring—Cam Friction
102	7240397	Switch—Declutching
103	7240365	Tube—Dial Light
14	7242576	Tuner—P. B. Tuner Less Reset Screws

Miscellaneous Mechanical Parts—Models 980690 and 980691

Illustration No.	Part No.	Description
	7240727	Cable Assembly—Speaker
	5274673	Cable—Volume and Tone Assy.
	1871260	Connector—"A"
	7240408	Dial Light Assembly
	7239475	Antenna Connector Socket
	7230283	Unmarked Octal Tube Socket
	7238539	Vibrator Socket

Tuner, Dial and Escutcheon Mechanical Parts for Model 980691 (Controls at Top) Only

Illustration No.	Part No.	Description
73	7238502	Bushing—Insulating Dial Light Tube
74	7241921	Bushing—Manual Drive
75	7242226	Button—Push Button Assy. "B"
76	7242227	Button—Push Button Assy. "U"
77	7242228	Button—Push Button Assy. "I"
78	7242229	Button—Push Button Assy. "C"
79	7242230	Button—Push Button Assy. "K"
80	7242093	Clamp—Dial
81	7240471	Clutch Assembly
82	7242006	Cord and Link Assembly
83	7242005	Cord and Spring Assembly
84	7241991	Dial—Glass
85	7240396	Drive Drum & Female Joint Leaf
86	7242039	Escutcheon
87	7240410	Lever—Declutching Switch
88	7241987	Plate—Pointer Backplate
89	7241984	Plate—Guide Plate Assembly
90	7240299	Plate—Tuner Mounting R. H.
91	7240298	Plate—Tuner Mounting L. H.
92	7241997	Pointer and Tip Assembly
93	7242058	Pulley and Stud
94	7241982	Reset Screw
95	7240287	Shaft—Declutching Switch Lev.
96	7241980	Shaft—Manual Tuning
97	7241992	Shield—Dial
98	7240292	Spring—Declutching Switch Lev.
99	7238950	Spring—Plunger Return
100	7237174	Spring—Universal Joint
101	7242551	Spring—Cam Friction
102	7240397	Switch—Declutching
103	7240365	Tube—Dial Light
14	7242576	Tuner—Push Button Tuner Less Reset Screws

Tube Complement

Illustration No.	Part No.		Description
	7232770	6K7	R. F. Amplifier
	7237886	6SA7	Oscillator Modulator
	7237887	6SK7	I. F. Amplifier
	7240267	6SR7	Det. A.V.C. & 1st Audio
	1213637	6V6GT	Push Pull Output

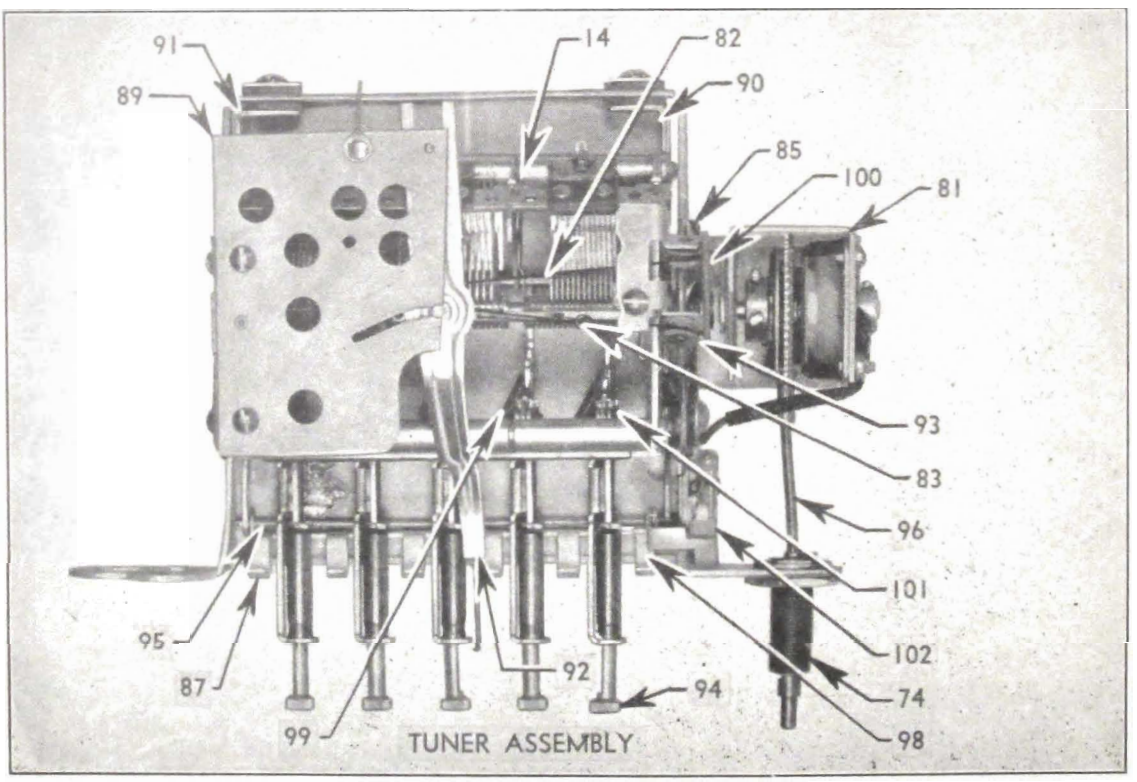


Fig. 12-126. Tuner Assembly

SPECIFICATIONS—ELECTRICAL

ITEMS	SERIES 40-A	SERIES 40-B	SERIES 50	SERIES 60	SERIES 70	SERIES 90
ELECTRICAL						
BATTERY						
Make	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy
Standard Number—Wet	15E2-W	15E2-W	15E2-W	17E2-W	17E2-W	17E2-W
Standard Number—Dry—Export	← 17E2-F & 17K3-F →		← 17E2-F & 17K3-F →		← 17E2-F & 17K3-F →	
Voltage	6-8	6-8	6-8	6-8	6-8	6-8
Capacity—Wet Battery (Amp. Hrs. at 20 Hr. Rate)	100	100	100	120	120	120
Number of Plates	15	15	15	17	17	17
Separator Material	Wood	Wood	Wood	Wood	Wood	Wood
Case Material	Hard Rubber	Hard Rubber	Hard Rubber	Hard Rubber	Hard Rubber	Hard Rubber
Battery Shipped—Domestic	Charged	Charged	Charged	Charged	Charged	Charged
Bench Charging Rate—Start	7 or Higher	7 or Higher	7 or Higher	7 or Higher	7 or Higher	7 or Higher
Bench Charging Rate—Finish	←If Gassing, Not More than 7→		←If Gassing, Not More than 7→		←If Gassing, Not More than 7→	
Case Length	19 5/16"	19 5/16"	19 5/16"	19 5/16"	19 5/16"	19 5/16"
Case Width	4"	4"	4"	4"	4"	4"
Case Height	7 15/16"	7 15/16"	7 15/16"	7 15/16"	7 15/16"	7 15/16"
Battery Height Over Terminals	8 1/16"	8 1/16"	8 1/16"	8 3/16"	8 3/16"	8 3/16"
Height Over Filler Caps	8 63/64"	8 63/64"	8 63/64"	8 63/64"	8 63/64"	8 63/64"
Where and How Mounted	←Clamp Down Type Hanger Under Hood→					
Which Terminal is Grounded	Negative	Negative	Negative	Negative	Negative	Negative
IGNITION SYSTEM						
Distributor—Make	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy
Location	←Center Right Side of Crankcase→					
Model	1110801	1110801	1110801	1110801	1110801	1110801
Drive	←Gear on Camshaft→		←Gear on Camshaft→		←Gear on Camshaft→	
Spark Control Advance Flywheel Deg.—						
Vacuum—Max. Deg.	10 to 12	10 to 12	10 to 12	10 to 12	10 to 12	10 to 12
Centrifugal	22-26	22-26	22-26	22-26	22-26	22-26
Flywheel Deg. Adv. at Dist. Eng. R.P.M.—						
Starting Point	0° at 400-480	0° at 400-480	0° at 400-480	0° at 400-480	0° at 400-480	0° at 400-480
Intermediate	10°-14° at 800	10°-14° at 800	10°-14° at 800	10°-14° at 800	10°-14° at 800	10°-14° at 800
Highest Point	22°-26° at 3000	22°-26° at 3000	22°-26° at 3000	22°-26° at 3000	22°-26° at 3000	22°-26° at 3000
Dist. R.P.M. at 50 M.P.H.—						
Regular Axle	1273.9	1325.0	1329.0	1172.8	1225.6	1285.0
Optional Axle	——	1234.6	——	——	——	——
Breaker Point Opening	.0125"-.0175"	.0125"-.0175"	.0125"-.0175"	.0125"-.0175"	.0125"-.0175"	.0125"-.0175"
Cam Contact Angle (Breaker Arm Worn In)						
.0125" Point Opening	32½ Deg.	32½ Deg.	32½ Deg.	32½ Deg.	32½ Deg.	32½ Deg.
.015" Point Opening	31 Deg.	31 Deg.	31 Deg.	31 Deg.	31 Deg.	31 Deg.
.0175" Point Opening	29 Deg.	29 Deg.	29 Deg.	29 Deg.	29 Deg.	29 Deg.
Spring Tension at Breaker Point	19 to 23 oz.	19 to 23 oz.	19 to 23 oz.	19 to 23 oz.	19 to 23 oz.	19 to 23 oz.
Condenser Make	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy
Condenser Capacity—Mfds.	.2 to .25	.2 to .25	.2 to .25	.2 to .25	.2 to .25	.2 to .25
Rotation—Distributor	←Counter-Clockwise Top View→		←Counter-Clockwise Top View→		←Counter-Clockwise Top View→	
*Timing Deg. Spark Full Advance	4 Deg.	4 Deg.	6 Deg.	6 Deg.	6 Deg.	6 Deg.
Octane Selector	None	None	None	None	None	None
*6 Deg. Adv. on Series 40 with Compound Carburetion.						
IGNITION COIL						
Make	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy
Model	1115024	1115024	1115024	1115024	1115024	1115024
Ignition Coil Location	← Front of Dash—Right Side →		← Front of Dash—Right Side →		← Front of Dash—Right Side →	
Amp. Draw of Coil—						
Engine Stopped	4½	4½	4½	4½	4½	4½
Engine Idling	2½	2½	2½	2½	2½	2½
Coil Pri. Res. Ohms. at 70 Deg. F.	1.23 to 1.33	1.23 to 1.33	1.23 to 1.33	1.23 to 1.33	1.23 to 1.33	1.23 to 1.33
Coil Pri. Induction (60 Cycle—A.C.M.H. at 2.5 A.)	6.4 to 6.9	6.4 to 6.9	6.4 to 6.9	6.4 to 6.9	6.4 to 6.9	6.4 to 6.9
Sec. Resistance at 70 Deg. F. Ohms.	2700 to 2900	2700 to 2900	2700 to 2900	2700 to 2900	2700 to 2900	2700 to 2900

SPECIFICATIONS—ELECTRICAL (Continued)

ITEMS	SERIES 40-A	SERIES 40-B	SERIES 50	SERIES 60	SERIES 70	SERIES 90
IGNITION SWITCH						
Make	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy
Lock Type	←—— Extension Coil Lock ——→		←—— Extension Coil Lock ——→		←—— Extension Coil Lock ——→	
Location	←———Instrument Panel———→		←———Instrument Panel———→		←———Instrument Panel———→	
Lock Make	←Delco-Remy, Briggs-Stratton→		←Delco-Remy, Briggs-Stratton→		←Delco-Remy, Briggs-Stratton→	
SPARK PLUG						
Make	AC	AC	AC	AC	AC	AC
Model	46	46	46	46	46	46
Thread	14 mm.	14 mm.	14 mm.	14 mm.	14 mm.	14 mm.
Gap	.023"-.028"	.023"-.028"	.023"-.028"	.023"-.028"	.023"-.028"	.023"-.028"
Location	← Right Side of Cyl. Head →		← Right Side of Cyl. Head →		← Right Side of Cyl. Head →	
SPARK PLUG WIRES—Make	Packard	Packard	Packard	Packard	Packard	Packard
GENERATOR						
Make	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy
Type	Shunt	Shunt	Shunt	Shunt	Shunt	Shunt
Model—Regular Gear Ratio	1102679	1102679	1102679	1102668	1102668	1102668
Optional Gear Ratio	1102679	1102679	1102679	1102668	1102668	——
Diameter	4 9/16"	4 9/16"	4 9/16"	4 9/16"	4 9/16"	4 9/16"
Location	←Left Side of Eng.—At Front→		←Left Side of Eng.—At Front→		←Left Side of Eng.—At Front→	
Mounting Type	←———— Hinged ————→		←———— Hinged ————→		←———— Hinged ————→	
Drive	← V-Belt from Crank Pulley →		← V-Belt from Crank Pulley →		← V-Belt from Crank Pulley →	
Rotation	←— Clockwise—Drive End —→		←— Clockwise—Drive End —→		←— Clockwise—Drive End —→	
Output Regulation	←Voltage & Current Regulator→		←Voltage & Current Regulator→		←Voltage & Current Regulator→	
Ratio—Generator to Engine—						
Regular Gear Ratio	1.901 to 1	1.901 to 1	1.901 to 1	1.981 to 1	1.981 to 1	1.981 to 1
Generator R.P.M. per M.P.H. at 50 M.P.H.						
With Regular Gear Ratio	96.86	100.74	101.05	93.30	97.11	101.82
With Optional Gear Ratio	——	93.87	——	——	——	——
Generator Field Fuse	None	None	None	None	None	None
Thermostat Control	None	None	None	None	None	None
Maximum Charge Capacity—						
Cold (Amps.)	32-34	32-34	32-34	32-34	32-34	32-34
Hot (Amps.)	32-34	32-34	32-34	32-34	32-34	32-34
Voltage at Maximum Rate	8	8	8	8	8	8
Amps. Motoring Freely	3.75 Amps. at 6 Volts at 800 R.P.M.—All Series					
Amps. Maximum Stall Current	34 Amps. at 5 Volts—All Series					
Amps. Field Coil Series	1.72-1.82	1.72-1.82	1.72-1.82	1.72-1.82	1.72-1.82	1.72-1.82
Main Brush Spring Tension (oz.)	24-28	24-28	24-28	24-28	24-28	24-28
Generator Drive End Bearing						
Make	N.D. 3203	N.D. 3203	N.D. 3203	N.D. 3203	N.D. 3203	N.D. 3203
Part Number	903203	903203	903203	903203	903203	903203
CHARGE INDICATOR—Make	AC	AC	AC	AC	AC	AC
CUT-OUT RELAY AND VOLTAGE AND CURRENT REGULATOR						
Make	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy
Model	1118201	1118201	1118201	1118201	1118201	1118201
CUT-OUT RELAY						
Cut-Out Relay Location	← In Regulator Unit on Dash →		← In Regulator Unit on Dash →		← In Regulator Unit on Dash →	
Voltage and Cut-Out Closing Hot or Cold	6.2-6.7	6.2-6.7	6.2-6.7	6.2-6.7	6.2-6.7	6.2-6.7
Cut-Out Contact Point Opening	.018"-.025"	.018"-.025"	.018"-.025"	.018"-.025"	.018"-.025"	.018"-.025"
Air Gap	.018"-.022"	.018"-.022"	.018"-.022"	.018"-.022"	.018"-.022"	.018"-.022"
Car Speed at Cut-Out Closing M.P.H.	0 to 4 Dis.	0 to 4 Dis.	0 to 4 Dis.	0 to 4 Dis.	0 to 4 Dis.	0 to 4 Dis.

SPECIFICATIONS—ELECTRICAL (Continued)

ITEMS	SERIES 40-A	SERIES 40-B	SERIES 50	SERIES 60	SERIES 70	SERIES 90
VOLTAGE REGULATOR						
Air Gap	.070"-.075"	.070"-.075"	.070"-.075"	.070"-.075"	.070"-.075"	.070"-.075"
Operating Voltage—						
Cold (72° F.)	7.3-7.7	7.3-7.7	7.3-7.7	7.3-7.7	7.3-7.7	7.3-7.7
Hot (150° F.)	7.2-7.4	7.2-7.4	7.2-7.4	7.2-7.4	7.2-7.4	7.2-7.4
CURRENT REGULATOR						
Air Gap	.080"-.085"	.080"-.085"	.080"-.085"	.080"-.085"	.080"-.085"	.080"-.085"
Operating Current—						
Hot (150° F.)	32-34	32-34	32-34	32-34	32-34	32-34
Cold (72° F.)	38-40	38-40	38-40	38-40	38-40	38-40
STARTING MOTOR						
Make	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy
Model	1107049	1107049	1107049	1107929	1107929	1107929
Location	Right Side	Right Side	Right Side	Right Side	Right Side	Right Side
Type of Shift	←——Mechanical Electrically Controlled——→					
Shift Actuation	Solenoid	Solenoid	Solenoid	Solenoid	Solenoid	Solenoid
Shift Operation	←——Accelerator Pedal——→		←——Accelerator Pedal——→		←——Accelerator Pedal——→	
Type of Drive	←—— Overrunning Clutch ——→		←—— Overrunning Clutch ——→		←—— Overrunning Clutch ——→	
Performance Data—						
Stall Torque	12 Ft. Lbs.	12 Ft. Lbs.	12 Ft. Lbs.	16 Ft. Lbs.	16 Ft. Lbs.	16 Ft. Lbs.
Stall Amperes and Volts	575 A., 3.4 V.	575 A., 3.4 V.	575 A., 3.4 V.	600 A., 3.0 V.	600 A., 3.0 V.	600 A., 3.0 V.
Running Torque—Ft. Lbs.	8 at 475 R.P.M.	8 at 475 R.P.M.	8 at 475 R.P.M.	8 at 625 R.P.M.	8 at 625 R.P.M.	8 at 625 R.P.M.
Running Torque—Amps.	375 at 4.1 V.	375 at 4.1 V.	375 at 4.1 V.	380 at 4.2 V.	380 at 4.2 V.	380 at 4.2 V.
Free Speed Voltage—Approx.	5	5	5	5	5	5
Free Speed Amps. at R.P.M.—App.	65 at 5000	65 at 5000	65 at 5000	65 at 5500	65 at 5500	65 at 5500
Armature End-Play	.005"-.050"	.005"-.050"	.005"-.050"	.005"-.050"	.005"-.050"	.005"-.050"
Brush Spring Tension	——	——	——	——	——	——
Solenoid Relay—						
Make	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy
Gear Ratio	16.22-1	16.22-1	16.22-1	17.33-1	17.33-1	17.33-1
Number of Teeth in Flywheel	146	146	146	156	156	156
Number of Teeth in Pinion	9	9	9	9	9	9
Pitch of Teeth	10-12	10-12	10-12	10-12	10-12	10-12
HORN—LIGHTS						
Horn—Make	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy
Type	Vibrator	Vibrator	Vibrator	Vibrator	Vibrator	Vibrator
Model	←——*High Note #1999520—**Low Note #1999519—All Series——→					
Mounting Location	←——Under Hood on Dash——→		←——Under Hood on Dash——→		←——Under Hood on Dash——→	
Amp. Draw—Left Horn (High)	17-19	17-19	17-19	17-19	17-19	17-19
Amp. Draw—Right Horn (Low)	19-21	19-21	19-21	19-21	19-21	19-21
Light Switch—Make	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy
Wiring Circuit—Single or Double	Single	Single	Single	Single	Single	Single
Headlight Circuit Protection	←—Thermo Circuit Breaker—→		←—Thermo Circuit Breaker—→		←—Thermo Circuit Breaker—→	
Location Protective Device	←———On Light Switch———→		←———On Light Switch———→		←———On Light Switch———→	
Body Circuit Protection	←—Thermo Circuit Breaker—→		Fuse 30 Amp. S.F.E.—Under Dash in Fuse Connector — M/41-SE and Series 50-60-70-90			
Headlight Make	Guide	Guide	Guide	Guide	Guide	Guide
Headlight Type	Sealed Beam	Sealed Beam	Sealed Beam	Sealed Beam	Sealed Beam	Sealed Beam
Headlight Cover Glass—Dia.	6 1/16"	6 1/16"	6 1/16"	6 1/16"	6 1/16"	6 1/16"
Direction Signal Lamp Make	Guide	Guide	Guide	Guide	Guide	Guide
Direction Lamp Location—Rear	←———Right and left lower corner of body—Combination with tail and stop lamp———→					
Direction Lamp Location—Front	←———Under headlamps — Combination with parking lamps———→					

**Optional with #1999544. **Optional with #1999543.*

SPECIFICATIONS—ELECTRICAL (Continued)

ITEMS	SERIES 40-A	SERIES 40-B	SERIES 50	SERIES 60	SERIES 70	SERIES 90
Direction Signal Switch—Make	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy	Delco-Remy
Direction Signal Flasher—Make	Tungsol-Flasher	Tungsol-Flasher	Tungsol-Flasher	Tungsol-Flasher	Tungsol-Flasher	Tungsol-Flasher
Parking Light Make and Location	← Guide—Under Headlamps—On Fenders →					
Tail Light Make	Guide	Guide	Guide	Guide	Guide	Guide
Tail Light Location	← On Body, Both Sides—All Series →					
Instrument Lights	Bright, medium and dim—Can be turned on and off only when tail lights are on—All Series					
License Plate Light Location	Trunk Handle	Trunk Handle	On Bumper	Trunk Handle	On Bumper	Trunk Handle
Mazda No. and Power of Bulbs—						
No. Req'd						
Headlights 2	45-35 Watt	45-35 Watt	45-35 Watt	45-35 Watt	45-35 Watt	45-35 Watt
Parking & Front Dir. Lights 2	1154L, 21-3 CP	1154L, 21-3 CP	1154L, 21-3 CP	1154L, 21-3 CP	1154L, 21-3 CP	1154L, 21-3 CP
Direction Signals—Rear 2	1129L, 21 CP	1129L, 21 CP	1129L, 21 CP	1129L, 21 CP	1129L, 21 CP	1129L, 21 CP
Direction Signal Indicator 2	51, 1 CP	51, 1 CP	51, 1 CP	51, 1 CP	51, 1 CP	51, 1 CP
License Plate Light 1	63L, 3 CP	63L, 3 CP	63L, 3 CP	63L, 3 CP	63L, 3 CP	63L, 3 CP
Stop Light and Tail Lights 2	1154L, 21-3 CP	1154L, 21-3 CP	1154L, 21-3 CP	1154L, 21-3 CP	1154L, 21-3 CP	1154L, 21-3 CP
Instrument Lights 4	55, 1.5 CP	55, 1.5 CP	55, 1.5 CP	55, 1.5 CP	55, 1.5 CP	55, 1.5 CP
Map Light 1	55, 1.5 CP	55, 1.5 CP	55, 1.5 CP	55, 1.5 CP	55, 1.5 CP	55, 1.5 CP
Dome Light	82-6 CP Double Contact (1 on Series 40-50-60-70) (2 on M/90, 91 & 91-F) (3 on M/90-L)					
Beam Indicator 1	51, 1 CP	51, 1 CP	51, 1 CP	51, 1 CP	51, 1 CP	51, i CP
Trunk Compartment Light	←From Tail Lights→		One 55, 1.5 CP	From Tail Light	One 55, 1.5 CP	From Tail Light
Radio Dial Light 1	55, 1.5 CP	55, 1.5 CP	55, 1.5 CP	55, 1.5 CP	55, 1.5 CP	55, 1.5 CP
Number of Clock Lights	1	1	2	1	2	1
Clock Light	55, 1.5 CP	55, 1.5 CP	55, 1.5 CP	55, 1.5 CP	55, 1.5 CP	55, 1.5 CP
Glove Compartment Light 1	55, 1½ CP	55, 1½ CP	55, 1½ CP	55, 1½ CP	55, 1½ CP	55, 1½ CP
Courtesy Lights—Front Seat ..2	82, 6 CP Double Contact — Series 50-60-70-90 — On M/44C, 41SE & 46SSE.					
Rear Seat	None	Two on 41SE—82, 6 CP Double Contact—Two on Series 50-60-70—4 on Series 90				
Fuse Location—						
Electric Clock	2 Amp., 1AG Fuse—Located in fuse container clipped to right radio support bracket—All Series					
Radio	15 Amp., 3AG Fuse—Located at end of lead-in at set (1¼" x ¼")—All Series					
Heater	14 Amp., SFE Fuse—Located on back of switch—All Series					
Defroster	14 Amp., SFE Fuse—Located on back of switch—All Series					
Direc. Signal Lamp—Frt. & Rear	14 Amp., SFE Fuse—Located in container back of instrument cluster—All Series					
Cigar Lighter—Front	Located in back of cigar lighter—All Series					
Cigar Lighter—Rear & Dome Light	(M/41SE and Series 50-60-70-90) 30 Amp., SFE—Located in container back of instrument panel and back of lighter					
Instrument Lighhs & Clock Light	14 Amp., SFE Fuse—Located on back of instrument lamp switch—All Series					
Center Partition Window Lift Motor	(M/91-F & 90-L) 30 Amp., SFE—Located in container back of instrument panel					